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EVOLUTION AND THE CHRISTIAN DOCTRINE OF HUMAN WORTH

A Vindication of Human Values From the Standpoint of Biology, Anthropology and Psychology.

An Essay

Written and Submitted By

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Introduction

Interpretations of the life process have a tendency to fall into one or other of two main classes. They are either ideological or holistic. That is to say, the mind, in interpreting the data of its experience may regard life as the progressive apprehension of a preformed structure, whose condition, although gradually unfolded, is nevertheless originally foreordained. On the other hand, it may see life as the milieu within which there is appearance in time of genuinely new characters, whose development is provoked by intensification of hitherto undifferentiated data.

These two general mind types are well illustrated by the contrasted philosophical outlooks of Plato and Aristotle. Plato, influenced by the teaching of Parmenides, concerned himself chiefly with contemplation of, and participation in, those eternal but immobile ideas which underlie all experience. He visualised life through the static perspective of forms and qualities, whose incessant recurrence within the mind tends to invest them with all the attributes of genuine fixity. Aristotle, whose philosophical affinities are with Heracleitus rather than Parmenides, was impressed by the forward movement of life, internally destined to attain a future definite end. He saw the intensity of function rather than the fixity of form.

It was the Platonic conception of essential fixity which proved more congenial to the Christian idea of separate species created by special divine fiat. Hence, in the main, the Christian doctrine of human worth has

n been influenced by the Platonic more than by the Aristotelian tradition.

Up till recent times, natural science has more or less fitted into the ideological schema. It has proceeded upon the assumption that all it had to do in order to make contact with ultimate reality was to work its way back in analytical regress to some primitive preformed structure which was unfolding itself serially in time. To reveal the successive stages and elements out of which all things have come was taken to be equivalent to a disclosure of the finally valuable. Hence ultimate origins were wedded with ultimate values. The union, however, has proved to be barren.

Doubtless the mechanistic trend of the 17th century added great impetus to this movement. The universe became a machine, while man degenerated into a robot. Each was motivated by an extrinsic agency, hence examination of forms seemed possible without prejudice to functions. The introduction of the microscope furthered the hope that structural analysis would yield the key to original values.

Biologically, this ideology is illustrated by the preformation theories of the 17th and 18th centuries. Beginning with Malpighi, it was assumed that the organs of the adult were already pre-existent in miniature in the embryo. Development was simply the "unpacking" of a structure already "there". The developed organism could be explained in terms of its antecedents.

Preformation reached its peak, and passed it, with Bonnet. For Bonnet, however, not the completed adult, but organic foci, forming the nucleus of the future development, were pre-existent in the embryo. This was the ideological legacy bequeathed by preformation to the 18th century. It was to appear later in the cellular atomism of Weismann. From the standpoint of biology, human values were reduced to "determinants" and "ids" and "biophores" and "chromosomes" and "genes".

This molecular trend in biology is closely correlated by a similar atomism in physics. Atoms and electrons were expected to deliver up the secret of the universe, and of man. In psychology and anthropology, the same quest for values through sub-human antecedents was enthusiastically taken up, with proportionate devaluation of the religious worth of man. Man in the 19th century was estimated in terms of what he had come from, rather than in terms of what he was capable of. When the full implications of Darwinism came home to religious thinkers, and the quest for values through origins was intensified, then there began for many,

that enormous plunge into the night;voyaging through
ten thousand years,
through boundless darkness without sight of land,
...all that agony of loss
as one by one the beacon fires of faith
are drowned in blackness.

Today the intellectual climate is changing. Human values, we believe are on the way towards rehabilitation. Not all the original details of the Christian valuation of man will be

vindicated, but the essential worth of man as a religious being is no longer in danger of being disrupted by natural science.

The disillusionment of science in general began about a generation ago, when it was discovered that the atom itself was no ultimate element, but was possessed of a 'structure' which included features not explicable in terms of physical analysis. Its parts could no longer be described in terms of 'matter'. The biological dénouement came with Lloyd Morgan's interpretation of evolution as a creative process, holistically expressing itself through the emergence of genuinely new characters, and increasingly richer wholes. ~~Continuity of process was qualitatively speeded up by intensive jumps into higher levels of life.~~

Science ceased to look backwards and began to look ahead. In looking ahead it found itself within a dynamic world where spiritual values were an integral part of the cosmos. The method of regressive analysis towards origins, instead of bringing science to grips with reality brought it face to face with human symbols and mental abstractions.

It is seen now that the whole combines more than the sum of its parts, that things are not only what they have come out of, nor even yet what they have become; they are also, and essentially what they might yet become. The evolutionary process is not mere re-arrangement of pre-existent material; it is a creative process constantly issuing in the genuinely new and the increasingly rich. Man as the "emergence" par excellence

regains the dignity which he at first sight seemed to have lost, for with the emergence of the essentially human there has developed a cosmic companionship possible to no other order of life.

The purpose of this essay is to assess this changing climate insofar as it pertains to the influence of evolutionary theory upon the Christian doctrine of human worth, more especially from the standpoint of biology, anthropology and psychology.

The question at once arises, "What are we to consider the doctrine of human worth to be? We are compelled to answer that there is no systematic treatment of the doctrine of man in the scriptures of the Old or the New Testament. Consequently no attempt will be made herein to enumerate in detail all the factors that might enter into such an evaluation. This is the task of the systematic theologian rather than the philosopher of religion. At the same time Christian anthropology is based upon certain fundamental conceptions of the worth of man arising out of the religious experiences of ~~man~~ humanity preserved for us within the scriptures.

In the Old Testament man is introduced to us as the centre of creation. In other words, from the very outset he is presented as being of

genuine worth in the sight of God. He is held to be separate from and superior to the brute creation by reason of his being created in the express image of God.. The immediate consequence of this special creation is that man is aloof from all other life in his ability to enter into direct communion with his Creator. All of his possibilities of personality are finally traced back to this fact.

Evolutionary theory then is compelled to deal with these two elements of personality, human possibilitiy arising out of its relation to God and man's sense of dependence upon the divine at every stage of his career.

At the same time ,the Old Testament emphatically declares that man's possibilities for good are counterbalanced by his propensities for evil. Man is endowed with the power to rebel but not finally to prevail against God.

The New Testament tacitly assumes the human values on which the Old Testament is based, but carries them along to new levels. Here again there is no systematic treatment of human worth. But the good news of Jesus Christ is inseparable from the supreme emphasis which He placed upon every individual soul. Behind every recorded transaction of Jesus with men

there is a profound sense of the sacredness and the eternal worth of human personality in the sight of God. Full recognition is given to the moral depravity of the human race. Jesus distinctly declared that He came to deal with sinners, not righteous folk. He accepted the fact of sin in human experience without argument. Nevertheless His faith in the final worth of man never faltered. It was axiomatic in all His teaching and practice that the roots of spiritual possibility struck deeper into the human soul than the roots of evil. The keynote of the New Testament is its unbounded faith in the possibility of new beginnings for human life when the life of man is linked up to the life of God. Even the abandoned and the lost meant much to Jesus because they meant everything to God. This is the very core of the Christian doctrine of human worth, that God and man are knit together in a fellowship of reconciliation which transcends the natural order of existence and which is broken only by the deliberate choice of man himself.

Arising out this, then, we assume for the purposes of our thesis that the religious worth of man is broadly conceived as follows. Man is regarded as a self conscious individual. To a certain extent he is able to determine the course of his own development.

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He enjoys a genuine affinty with certain personality-enriching features in his environment. In other words we are men by reason of that self consciousness and self determination which which unites us to the eternal spirit of the universe. And it reasonably assumed that man has potential worth,in spite of present devaluation, arising out of his free fellowship with the divine.

Beyond all the ~~xxkxkxx~~ worth that accrues to human life through the operation of the laws of natural causality there is a fund of spiritual possibility traceable in the last analysis to the fact that "Our life is hid with God in Christ".

All interpretations of life are necessarily selective,although not thereby arbitrary. We select biology and psychology because it will be part of our thesis to maintain that these studies must never be separated. There is no such thing as a biology which can ignore the functional nature and therefore the psychic integration of the organism which it studies. It will be maintained however that the psychic integration in man is more than psychobiological.

Our interest in anthropology is chiefly to show that origins do affect ultimate values.

Generally, the argument follows three main divisions, biological, anthropological and psychological, followed by a constructive statement. Since our chief interest is from Charles Darwin onwards, only brief reference is made to the pre-Darwinian phase of evolution. Early Greek anticipations of the idea are outlined, with particular reference to Aristotle, whose functional approach is becoming more and more important for modern theory. The continuity of the general idea of evolution is then traced through such pioneers as Descartes, Leibnitz, Buffon, Erasmus Darwin, and Lamarck.

It was ~~with~~ through Charles Darwin that evolution first came to close grips with the Christian doctrine of human worth. Darwin's theory is stated and its effect upon human values noted. The relation of Darwin to Lamarck and Malthus is discussed, and his main principle of natural selection critically estimated.

Following Darwin, religious values suffered eclipse from the mechanistic biology of Weismann. His theory of the continuity of the germ-plasm is reviewed in the light of modern criticism, and evidence is submitted to show the reality of the inheritance of acquired characteristics.

Examination is then made of the various theories to explain memory, put forward by Butler, Hering, Semon, Rignano, and Bousfield, the principle being established that the organism is characterised by a psychic integration without which its

rôle in evolution is not adequately understood. Philosophic support for the reality of the agent in evolutionary development is seen in the work of James Ward.

The continuation of the mechanistic trend in biology is then traced through Mendelism, Mutationism, and the Chromosome Theory. The importance of these movements is assessed in terms of their relation to human worth. From the Mutation Theory we deduce the valuable principle that a mutation is fruitfully regarded as biological evidence of the organism's inherent ability to make a qualitative change of its evolutionary direction when confronted with a critical survival problem.

The biological section of the argument closes with a critical review of some salient features in three modern trends in evolutionary biology, and their significance for our thesis estimated. These are, "The Science and Philosophy of The Organism", which establishes the category of the whole, "Psycho-biology", which hyphenates two inseparables, and "Emergent Evolution", which guarantees the important principle of the emergence of the genuinely new. All of these have unique worth for the Christian valuation of human worth.

In the second division of the argument, the upward climb of the manward-headed organism is traced, and the important principles discovered in the biological field applied to the important facts of anthropology. It is claimed that in the ascent from protoplasm to personality, there is evidence of the functioning of a transcendent factor, and that the salvation of the human~~ward-headed~~ progenitor ~~stock~~, at every stage of its developing career, has depended upon constant cooperation with this psychic factor.

Preparatory to a criticism of "the myth of our ape-ancestry", the relation of structure and function is discussed, and the importance of the law of convergent evolution ~~being~~ pointed out. The organic synthesis of structural development, the retention in man of primitive unspecialised features, the preparation for the mind life, are then considered, and Wood Jones' argument for the non-anthropoid evolution of man reviewed.

Within the continuity of evolution, there has been a mutational factor at work. This mutational principle is now applied to the actual evolution of man himself, and evidence of his uniqueness discovered in the fact of his qualitative divergence from the historical life stream. The paucity of anthropoid fossils and the danger of generalisation from anything less than the organism "alive and whole" is pointed out. Finally the antiquity of man is reviewed, and the evidence of the chief fossil humanoid remains evaluated. Argument is submitted that "the big brained tendency" in the

humanward-moving stock effected a unique reorientation of its evolutionary direction, thereby making possible the emergence of homo-sapiens as a self-conscious being. The section then closes with evidence of the general prevalence in nature of the factor of discontinuity.

The third phase of the argument deals with the relation of evolutionary psychology to the religious worth of man. In the preceding stage, the qualitatively new emergence of the distinctly human has been argued, hence we may now take it as a basic principle that man carries within himself, not in his antecedents, the norm of the interpretation of his own genius.

The place of the mind in psychology is briefly traced from Bacon, through Locke, Berkely, Hume and Kant. The effect of the evolutionary theory is noted, and the conclusion reached that the evolutionary conception of mind spiritualises nature rather than naturalises the spirit. Later on, the advance from Kant is seen in the philosophy of Karl Heim.

The true uniqueness of man, psychologically, is now considered, and the animal-human relationship considered. The urge to become, the relation of antecedents to consequents, the dynamic factor in self-consciousness and the significance of remorse are evaluated in support of the uniqueness of the spirit of man.

In anticipation of the analysis of instinct, the principle of "the organism as a whole" is asserted to be ultimate for the religious interpretation of human worth. The relation of instinct to personality is then examined to show that instinct always operates in the interests of a self, which has certain fundamental needs, the role of instinct being to satisfy these needs. The religious worth of man is closely related to these fundamental life needs, since they bear witness to man's awareness of God. The discussion of the "religious instinct" evokes the claim that religion is sui generis, a"God-relationship".

The assessment of instinct in terms of needs, paves the way for an examination of psycho-analysis insofar as it affects religious values. Freud and Tansley are selected as representative for our purpose. Elliot Smith is quoted as evidence that the fundamental human quest is a search for "life". The validity of the religious "projection" is upheld, a distinction being drawn between the motives underlying projection considered psychologically and religiously, and the uniqueness of conscience as a religious relationship is argued.

A constructive statement is offered of the contribution made by the new psychology to the religious interpretation of human values. The problem of sin as a negative factor in human worth is considered, and finally assessed as a religious relationship which carries real evidence of the worth of man.

The consideration of the problem of sin opens the question of defective personality, necessitating a statement of our metaphysical assumptions. This includes belief in a teleological interpretation of nature, evidence for which is seen in the studies of Henderson. The relation of evolution to potentiality is then considered. The law of increasing entropy is recognised but held to be superseded in the value enriching relationship between man and a creative God. ~~The practical faith of Jesus and Paul in human potentialities is briefly illustrated~~.

In support of our claim that the self is always en rapport with a creative background of experience, Karl Heim's doctrine of The Perspective Figure is reviewed. The application of this doctrine to the evolutionary process in general is held to be implied in A.N.Whitehead's philosophy of the organism.

The argument closes with a consideration of the person of Jesus in relation to evolutionary development. It is maintained that we must appeal to more than evolutionary categories to account for the testimony of history and the witness of experience. He is the Logos of God, come in the fulness of time, to safeguard the destiny of the race. Hence the Incarnation is the divine witness to the eternal worth of man.

We take this opportunity of acknowledging our indebtedness to Principal Hughes, Professor Lamont, and Professor Simpson. While they are in no wise responsible for the opinions stated herein, their generosity of suggestion and criticism has been exceedingly helpful.

SECTION ONE

1. Pre-Darwinian anticipations of Evolution..

The Early Greeks

It is quite clear now that the idea of a developing process in nature is as old at least as the philosophers of ancient Greece. Earlier civilisations there have been, but their contribution to scientific knowledge is so closely interwoven with primitive mythology and theology as to be of little importance. It was the Greek who first made bold to seek a naturalistic interpretation of the phenomena of life. Yet it is not always appreciated to what a remarkable degree these pioneer speculators anticipated the modern evolutionary theory.

Anaximander(610-540 B.C), a pupil of Thales, surmised that the universe began as a sort of "boundless infinite", an undifferentiated mass whence everything had arisen by a process of "separation of opposites". All things were but a transitory manifestation of this infinite ground plan, and were destined to be swallowed up eventually in their original source. Centuries later, Herbert Spencer was to theorise on the "homogeneous" and "alternating integration and differentiation". It is obvious that the Spencerian categories find their prototypes in the "infinite" and the "eternal motion" of Anaximander.[i]

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i. c.f Taylor. Evolution in the Light of Modern Knowledge.p441.

But Anaximander's most striking anticipation of modern theory is his intuition that man has an ancestry going back through the fishes. Pondering the helplessness of human infancy, he shrewdly argued that man could not have existed always as he is in his present form; his infantile helplessness would long ago have led to his annihilation. Aware of the existence of certain sharks, which in time of danger protect their young by swallowing them, Anaximander coupled the genealogy of man with this fish. His full conclusion was that life originated in the sea, but was driven to the land owing to the receding of the waters, that some such creature as the shark, able to protect its young, developed the ability to breathe the air, adopted a land habitat, changed its habits and structure accordingly, and became the progenitor of all land life. This striking speculation reads like a page from a textbook of modern biology.

A doctrine of perpetual motion was advanced in the 'flux' philosophy of Heracleitus (530-470 B.C.). All things flow in a ceaseless becoming; nothing is at rest; there is motion even in the seemingly still matter. This hypothesis of 'constant variation' in nature was supplemented by another striking anticipation of the later Darwinian theory of the struggle for existence and the survival of

the fittest through natural selection. "Through strife', declared Heracleitus,'all things rise and pass away.... war is the father and king of all...some he has made gods, and some men, some free and some slaves". Yet through all this flux of struggle and variation and selection there is the constancy of law. "This order, the same for all things, no one of gods or men has made; but it always was and is and shall be."

Evolutionary ideas were still further anticipated in the doctrines of Empedocles(c.445 B.C.) It was the belief of this philosopher that nature, in its experiments with organisms, produces various combinations that meet environmental needs. When this occurs the organism survives and perpetuates its kind; otherwise it perishes.

With the Atomists, however, this trend of speculative interpretation found itself in a cul-de-sac. The universe, hitherto abounding with life and a measure of spontaneity, degenerated into a vast mechanism. "Everything" declared Leucippus,'is driven by necessity". "In reality, there are only atoms and the void" said Democritus. Design was denied. But even the Atomists', in their belief that these types survived which best fitted their environment, touched in spirit the essence of the theory of natural selection'. We might add that their belief that new worlds are constantly

arising by the 'selective aggregation' of similar atoms forms a suggestive background for the modern theory of evolution by 'emergence', which proceeds from 'favorable combinations."

This line of fruitful theorising-it can scarcely be termed scientific investigation- was submerged for a time while the attention of men was claimed by the ethical and political philosophies of the Sophists and Socrates and Plato. It was rescued again by the genius of Aristotle(385-322 B.C.)

Lewes, in his treatise on[i] Aristotle, gleans from Pliny the information that Alexander the Great instructed his hunters and gamekeepers and gardeners and fishermen to send to his friend Aristotle all the biological and botanical material that the philosopher might request. With this material Aristotle established a magnificent 'zoo'. His deductions, gleaned from observation of his specimens, are of particular interest for modern evolutionary theory.

With such a wealth of material before him Aristotle could not avoid the conclusion, that despite the great variety manifested in life, this variety could nevertheless be arranged in a continuous series. Life in all respects, of structure, sensation, etc, could be arranged in an ascending scale with minute gradations linking the lowest

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i Aristotle; London 1864. p.15.

organisms to the highest[1]. Nature makes so gradual a transition from the inanimate to the animate kingdom that the boundary lines which separate them are indistinct and doubtful. There may even be some degree of life in the apparently lifeless. In certain species also, the line of demarcation between plant and animal is blurred. While life has thus grown steadily in complexity and in power[2], intelligence has increased in correlation with complexity of structure and mobility of form. There has been increasing specialisation of function together with a continuous centralisation of physiological control[3]. Life was moving towards the achievement of a brain, driving steadily towards richer relationship with the living environment.

Embryology comes to birth with Aristotle, so that he can say that "he who has seen things grow will have the finest view of them." Even the Mendelian Law of Inheritance had been at least a problem for Aristotle for he considers the case of a white woman who married a negro; the first generation of children was all white; in the next generation negroes appeared. Where was the blackness hidden in the middle generation?[4]

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1. Hist. Animalium, viii.
2. De Anima ii, 2.
3. De Partibus Animalium. iv, 5-6.
4. Gomperz 'Greek Thinkers' vol iv p.169

For the above references we are indebted to the chapter on Aristotle in "The Story of Philosophy" W. Durant New York 1926

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The progressive development which Aristotle saw in life was no haphasard affair. The world was ruled by ends. Life manifested itself in wholes, seen first in organisms,rising in the 'scale' according to their degree of articulateness. Everything living was motivated by a tendency to become better than it was in its present form. The whole living process was really a striving upwards of 'matter' towards form. A thing is at once the 'form' that has grown out of its 'matter', and in its turn that 'form' becomes the 'matter' out of which a still higher 'form' may develop. By 'form', Aristotle signifies the realising of the capacities latent in 'matter'.

The trend of life is thus towards a definite fulfilment. Everything is internally guided by its own dynamic nature and structure, or its 'entelechy', that is to say, literally 'having its being within'. The egg of the chick moves towards its own destined end.'It is internally organised to become not a duck but a chick.' This design is due to no external influence; it is inherent in the very nature and function of the organism to develop into something richer.

To this doctrine of the dynamic autonomy of the living organism, modern biology is paying respectful attention. It now seems that some such interpretation as that sponsored by Aristotle will require to be adopted to do justice to the discovered facts.

The fertile speculations of the early Greeks failed to take root in the ancient world. The science which Greece finally passed on to succeeding ages was the thought of a universe where the same elements had always existed, and the same species had maintained themselves unchanged.

With the passing of Aristotle, the definitely scientific interest disappeared for practically a thousand years. Christian theology, in its search for human values, swung in another direction. Speculation about life and nature was governed by the Genesis stories of Creation, and the preservation of the animals at the flood. Hence it was accepted as axiomatic that the various life-forms came directly as they were from the hand of God.

Descartes But the naturalistic interpretation of life did not perish. When the authority of ecclesiasticism began to wane, man's mind again sought a plain understanding of nature. It was Descartes(1596-1650) who gave a first sketch of a scientific cosmology, advancing the notion of a gradual building up of the world from simple beginnings by means of powers inherent within nature herself. Descartes also suggested the possibility that the higher forms of life might have been produced from the lower by a process of mechanical evolution.

He was careful, however, to say that this was merely one of many possible hypotheses, and not necessarily his own opinion. Science was not yet free to speak its own mind apart from theological censure.

LEIBNITZ A generation later, Leibnitz opposed the mechanism of Descartes with what amounted to a theory of evolution on a large scale. Given an initial push by a "deus ex machina", Descartes had been able to get his universe into motion. Development could then be explained from some homogeneous substance, existing at first in a disintegrated form-a notion which was later developed in the nebular theories of Kant and Laplace.

For the inert matter of Descartes, Leibnitz substituted an energy which was all-pervasive. This energy was no mere occasional force, but a continuous activity. It left no gaps requiring an outside stimulus to set it going again. Moreover, this immanent energy was a steady movement in the direction of perfection. Even if progress was slow it was at any rate certain, for although the forward steps might be infinitesimally small, their minuteness was more than counterbalanced by their infinite frequency.

Here was evolution magnificently conceived. This developmental optimism of Leibnitz was read to good purpose in France, with the result that his ideas spread rapidly among eighteenth century thinkers, to become the stimulus for many fanciful evolutionary theories.

Buffon It was about this time that Buffon, the great French naturalist, was cautiously giving expression to his evolutionary convictions, swaying, as Butler says, "between

the orthodoxy of the Sorbonne, and a belief in l'enchainement des êtres"[1] Buffon was probably the first modern to account for unity of plan on the basis of community of origin and he supported his views with a theory of the direct modification of animals by environment. Buffon had as his pupil, Lamarck, who at the beginning of the 19th century became an ardent champion of biological evolution.

Erasmus Darwin. Erasmus Darwin, grandfather of the greater Charles Darwin, had meanwhile asserted that "from the metamorphoses of animals...we are led to conclude that they have been alike produced from a similar living filament". To explain these metamorphoses he made use of a principle of 'response to need' which was to receive fuller elaboration at the hands of his contemporary Lamarck. In the words of Darwin, "all animals undergo perpetual transformations, which are in part produced by their own exertions in consequence of their desires and aversions...many of these acquired forms or properties are transmitted to their progeny."[2]

Lamarck. Lamarck, in early years a materialist, became at an advanced age one of the most ardent of vitalist evolutionists. He shared with Erasmus Darwin the conviction that the chief factor in evolution was the transmission of traits acquired through adaptation to environment. Environmental

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1. S. Butler. Evolution. p.165

2. Zoonomia. 1794. Sec.xxxix, 4. p.501

influences stimulate certain needs in the organism; in response to these needs the organism develops certain characteristics and passes them on to its offspring.

It was this doctrine of 'response to need' which was later to mark the main battle ground between the Lamarckian and the Neo-Darwinian interpretations of evolution. Lamarck laid great stress on the presence of a psychic factor in development. It will be worth while to quote him at length here. "It must not be supposed that its surroundings directly affect any modification whatever in the form and organisation of an animal. Great changes in surroundings involve great changes in the wants of animals, and these changes in their wants involve corresponding changes in their actions. If these wants become permanent,or of very long duration, the animals contract new habits which last as long as the wants that give rise to them..on the other hand,new wants have rendered a part necessary,which part has accordingly been created by a succession of efforts..use has kept it in existence..disuse has led to its gradually ceasing to receive the development which other parts attain to..and in time disappears."[i]

The changes produced by this ~~organism~~ striving of the organism are capable of being transmitted to offspring.

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i. S. Butler. Evol. 221-25.

In opposition to the Lamarckian recognition of a psychic factor in evolutionary change, Neo-Darwinism was to maintain with equal insistence that evolution proceeded in consequence of a rigorously mechanistic principle of 'natural selection.' The attack on Lamarckianism was led by Cuvier, so that, when the star of Charles Darwin was shining bright in the evolutionary firmament, the doctrine of 'response to need' was generally discredited among men of science.

Today there is a decided trend towards the Aristotelian and the Lamarckian emphasis. We shall have occasion later on to return to the doctrine of needs. In passing, it is worthy of notice that the modern theory of hormones has been curiously anticipated by the words of Lamarck. "When an animal is prompted to this or that action, there is an excess of nervous fluid to the organs which are to execute it."[i]

Evolutionary theory was enthusiastically championed by the philosopher Schelling, and also by his successor Hegel. But these men coupled evolution with a metaphysical interpretation that could not commend itself to scientific opinion. Had Hegel lived some twenty years longer than he did- he died just a year after the publishing of the 'Origin of Species'- his philosophy of nature might have been touched

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i. Butler. Evolution. p.309

more with flesh and blood. As it was, he sensed evolution only in a ghostly fashion; it was real only because it was 'ideal' "Metamorphoses can be ascribed only to the notion as such, because it alone is evolution....it is a clumsy idea.....to regard the transformation from one natural form and sphere to a higher as an outward and actual production."

Meanwhile the old creationist outlook was receiving hammer blows in other realms of thought as well as the biological. The Nebular hypotheses of Kant and Laplace, the pioneer work of John Hutton, and more especially the geological principles of Lyell had compelled thoughtful men to consider evolutionary ideas. Lyell's 'Principles of Geology' appeared in 1830, furnishing a much needed time scale for the interpretation of the biological facts that had been forth/coming. In 1844, an anonymous author published 'Vestiges of the Natural History of Creation', in which were set forth cogent arguments for evolution from the standpoint of biology, cosmology, and geology. By 1852, only seven years previous to Darwin's 'Origin of Species', Herbert Spencer published an essay on 'The Developmental Hypothesis', submitting a powerful philosophical argument for the progressive evolution of the whole universe, including man and society. But science was witholding its complete assent till the objective evidence for evolution was forthcoming in systematic fashion. The stage was set for the appearance of a genius.

In 1858 came the joint announcement of the hypothesis of natural selection by Charles Darwin and Alfred Russell Wallace. The following year, the 'Origin of Species' appeared, and evolution came into its own. The facts which had been steadily accumulating since the beginning of the century seemed to find their natural explanation in the Darwinian hypothesis.

2. Charles Darwin.

We have seen that the idea of evolution itself had a history before its great vindication through Charles Darwin. But even if the idea did not originate with Darwin, it was certainly he who brought home with telling effect, supported by a great mass of evidence, the significance of it. It was Darwin's amazingly systematic presentation of the multitudinous facts that compelled thoughtful people to see the real issue. The situation is summed up by Butler, who decla/res, "to the end of time, if the question be asked 'who taught the people to believe in evolution', there can be only one answer-that it was Mr Darwin."[i]

Darwin was driven to his theory of evolution by the pressure of facts in the fields of comparative anatomy, of geological succession, of embryology, and of the geographical distribution of living and extinct forms. Along these lines he organised the great wealth of data amassed through his own observations of plants and animals. Confronted by the fact of multitudinous existing species, his problem resolved itself into a search for the origin of such species, a quest for some explanatory principle which might reasonably be advanced as an hypothesis to account for the present variety of life from some originally simple expression of matter.

Life in the beginning he took for granted.

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i. Butler. Life & Habit. p.277.

A simple calculation proved to Darwin that some selective agency must be at work upon life, sincen if every born member of every species survived and propagated in natural ratio, even a short time would be sufficient to over-populate the earth so that life would become impossible.

To illustrate from the case of the common thrush.In a completed life cycle of the parent birds,say ten years,if all the progeny survived and bred in ordinary ratio, their offspring would mean a population of nineteen and a half millions. In some twenty years,this would become two hundred millions, and in thirty years, one hundred and twenty trillions. In other words, in a very short time, with no depletion in their ranks, there could not be room for a fraction of such an army on the whole surface of the earth,if they were all ranged side by side.

The case of the thrush is paralleled by the history of the herring. Neither earth nor sky nor sea could support the unrestricted progeny of all living creatures. The obvious explanation of the existing facts was to assume that nature placed a premium upon survival.

This premium,Darwin and Wallace,working independently, discovered in the principle of natural selection, based upon the struggle for existence and the survival of the fittest. Recognising that no two plants or animals are exactly alike, Darwin assumed that their differences had a survival meaning. They represented in fact the conservation of some

characteristic which had proved valuable to its possessor in the struggle for existence, a struggle in which none but the favoured few could possibly win out. Such preferential variations might be infinitesimally small, developed and transmitted over long periods of time, but the nascent science of geology supported Darwin with a convenient time schema. His conclusion was that these infinitesimal preferential variations, operating over an infinity of time, would accumulate from generation to generation, and so at last account for the present variety of living forms upon the earth.

In other words, all organisms vary continually and their variations are hereditable. In the struggle for existence, by a process of rigorous natural selection, those individuals are eliminated which are not possessed of preferential variations moving in the direction of increasing adaptation to their environment. "If variations, useful to any organic being do occur, assuredly individuals thus characterised will have the best chance of being preserved in the struggle for life, and from the strong principle of inheritance, these will tend to produce offspring similarly characterised."[i]

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i. Origin of Species 1902. p.160

The effect of Darwin's theory of evolution.

Whitehead states that 'by a blindness which was almost judicial as being a penalty affixed to hasty superficial thinking,many religious thinkers opposed the new doctrine,although in truth a thoroughgoing evolutionary philosophy is inconsistent with materialism"[i]. This of course is very true, but it scarcely does justice to the feelings of the men who met the first onslaught of Darwinism on human values. The main attack was launched through the theory of natural selection. If natural selection were henceforth to be regarded as the true cause of evolution,then God of course was no longer needed; He was bowed none too politely out of existence and His place taken by a blind automatic natural force working not so much for righteousness as for survival of the fittest. When the problem came to be narrowed down to man himself, it seemdd that man was to be completely assimilated to nature, and the shaping of his destiny left to the whimsical action of the same natural force that controlled the movements of all other species. God,so to speak,died a natural death and man became a waif of circumstances, linked by his evolutionary genealogy with the lowest forms of animal life, from which by slow and insensible gradations his physical and mental faculties had been developed.

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i. Whitehead. A.N. Science & the Modern World. 1926.ed. p.157

Beneath the ignorance and the violence of the first opposition to Darwinism, there was a genuine assertion of the spirit of man which legitimately rebelled against this disintegration of its eternal worth. Men rightly refused to believe that the mark of the beast was equivalent to the insignia of divine sonship. It is only right of course to point out that the great naturalists who sponsored evolution refrained from directly pressing this devaluation of human worth, but the logic of their premises pointed to no other conclusion at the time.

It is only now, when the heat of the original controversy has passed, and man has had time to see evolution itself in true perspective, that we begin to see that the natural body which was laid in the grave by Darwinism has been resurrected into a more spiritual body. Far from laying man in the dust, a true estimate of evolution rehabilitates man to the dignity from which he was first dethroned by Copernicus. The process by which all the existing forms of life are held to be related by descent to the simpler forms of long ago has proved itself an intuition of genius supremely valuable for our understanding of life. It has also confirmed in the minds of thoughtful men that supreme conviction of the religious experience, that there is discoverdd a 'sense of the eternal in the present moment' .

There are those who assert that the present disintegration of spiritual values is a direct outcome of the process of denudation that commenced with the Darwinian conclusions."The present depression of humanity has its origin...solely in man's sense of his origin. The human race feels itself like a rat in a trap....humanity rots for a new definition of life." i

We are inclined to agree with this verdict. In a large measure human progress is dependent upon a genuine recognition of the worth of a man in his relation to the universal scheme of things. We venture to predict that humanity will not make a forward advance until it rediscovers the essential worth of its history and finds a worthy interpretation of nature in relation to its humanity.
It is the admitted purpose of this essay to seek to discover the valuable elements of human life in relation to the facts advanced by the evolutionary hypothesis, more particularly as these facts have been revealed through biology, anthropology and psychology.

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i. The Glass of Fashion. p.170

Some Influences Which Moulded Darwin's Thought.

Darwin's epoch-making "Origin of Species" was first published in 1859. But the idea that 'man is the modified descendant of some pre-existing form', while chiefly the result of Darwin's work, is admitted by the great naturalist to be much older than himself. In a letter to Lyell the geologist, in March 1863, Darwin states that "Plato, Buffon, my grandfather-Erasmus Darwin, -before Lamarck and others, propounded the obvious view that if species were not created separately, they must have been descended from some other species."[1]

Again, he speaks of Lamarck as upholding "the doctrine that all species, including man, are descended from other species."

The real genius of Darwin was his masterly and systematic presentation of the evidence for evolution in such a way as to compel assent to his conclusions.

Darwin came early into touch with the work of Lamarck. During his service as naturalist on the 'Beagle', Darwin had read with avidity Lyell's "Principles of Geology". Lyell, standing out against the general trend of contemporary scientific opinion, championed Lamarck, and had given a chapter of his book on geology to an exposition of the Lamarckian theory of evolution.[2] Darwin, in framing his own hypothesis, came to repudiate the Lamarckian factor, asserting

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i. Histor. sketch to later ed. of Origin of Species.
2. c.f 10th ed. Vol.2. p.246.ff

that from Lamarck's 'wretched book' he had learned nothing.[1] Yet although he was inclined to treat the Lamarckian viewpoint with scant respect,it is significant to note that in later years Darwin profoundly modified his views, so that he could declare, "In my opinion the greatest error which I have made has been not allowing sufficient weight to the direct influence of environment ,,,independently of natural selection."[2]

This admission is typical of an admirable trait in the great naturalist, to recognise at all times his own limitations. We feel that the true scientist speaks in these words. As a matter of fact, Darwin had availed himself from the first of the Lamarrkian principle of use and disuse,[3] where natural selection failed him. The longer he lived it seems that the more Lamarckian he became.

The Main Source of Natural Selection. Malthus

In 1798,Rev.Thomas Robert Malthus, a Surrey curate who was interested in economics,published an essay on'Population'. It is to this work that Darwin is indebted for the central idea of his evolutionary hypothesis, the doctrine of natural selection. The thesis of Malthus was that humanity tends to reproduce its kind at a rate which outstrips the means of subsistence, and is kept within bounds only bysuch natural restrictions as famine,pestilence,war,etc.

1.'Darwin. Life and Letters.' vol.iii.p.14.
2. 2nd ed. of Descent of Man. 1876.
3. c.f Origin of Species. p.170-3 for relation of blindness to cave life.

Through these agencies, ~~excess~~ surplus individuals are eliminated.

Darwin, fifteen months after his return from the "Beagle" expedition, immersed in his sea of data, chanced to read,as he says,for amusemant, the work of Malthus, and "being well prepared to appreciate the struggle for existence which everywhere goes on, from long and continued observation of plants and animals, it at once struck me that under these circumstances,favorable variations would tend to be preserved and unfavorable ones to be destroyed. The result of this would be the formation of new species. Here then I had a theory by which to work."[i]

The fertile mind of Darwin,pregnant with the data of his own observations, labouring hard, gave birth to its great intuition. If slowly propagating man outstrips the means of subsistence, how much more both plants and animals! So Natural Selection was born.

This Malthus-Darwin inspiration was to prove a real nightmare to the nineteenth century. Its final outcome was the abstracted and hypothetical "ecomomic man". However it is not our business to trace his fortunes here. It is sufficient to state that a study of all the factors involved in population movement now shows conclusively that the thesis of Malthus rests upon a misreading of the population expanse

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i. W.C.D.Dampier-Whetham. A History of Science. p.295

which came with the advent of the new industrial order in England, a transitory condition which could not be expected to furnish a universal rule of population behaviour for normal times. In a later edition of his work, Malthus recognised this. The evolutionary generalisation based upon the Malthusian doctrine naturally suffers corresponding devaluation.

Critical Appreciation of Natural Selection.

We are in a better position today to estimate the worth of this principle of natural selection. To begin with, the primary struggle for existence, hailed as the raison d'être of natural selection, needs to be reinterpreted. "Nature red in tooth and claw" is no longer a fair judgment of nature as a whole, and nothing less than the principle of the whole will suffice as interpretative today. Any account of the life-striving is incomplete which fails to acknowledge the significant fact of mutual aid and cooperation between species.[i] Life is not primarily a mere snatching for self; on that basis it could never have attained the richness that it has reached. Life has its fine moments; the facts of parental care, of the willingness to surrender life for offspring, these are but indications of an altruism and cooperation without which nature is not legitimately evaluated. Moreover,

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[i] cf. H.Drummond. 'The Ascent of Man.'. ch.7. for an early recognition of these facts.

when the full facts of symbiosis[i] have been brought to light, we venture to declare that it will then be seen that the struggle for individual existence does not relate one half of the whole life story. Nature is permeated with instances of cooperative living; social life is the rule rather than the exception, and social life implies a conception of individual and mutual worth which the raw struggle for survival denied.

The works of Kropotkin and J.A.Thomson clearly show that the 'mutual aid' spread over the 'web of nature' involves a communal relationship between creature and creature, and between creature and environment, which divests the struggle for existence of its ruthlessness, and sets 'natural selection' in its real perspective.

It becomes increasingly evident today, that there is inherent in the developing organism a spontaneity of outreach and responsiveness which calls for recognition in terms that transcend natural selection. In proportion as we rise higher in the scale of organic life, so that spontaneity becomes more and more significant, ~~until~~ In man we find it manifesting itself as cooperation with value-inducing and value-sustaining features in the environment, where natural selection becomes non-operative, and wherein man achieves a dignity which sets him above nature. Natural selection is itself increasingly

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i. We are indebted to Prof. J.Y.Simpson for a reference to the work of Buchner which sets out very clearly the all pervasive presence of symbiosis in nature.

selected in the interest of an emerging moral and religious criterion. It finally becomes possible for man to say that it is in God that he lives and moves and has his being, a declaration which is at the heart of the Christian valuation of man.

It is in virtue of this spontaneity-which we maintain to be <u>the</u> characteristic of organic life-that the organism is enabled to rise above natural selection and to ~~make over~~ control its environment, ~~rather than to submit to being made over by purely natural factors~~. Natural selection is opposed, for the most part successfully, by what we would designate as 'autonomous selection' , the primary capacity of the organism to adapt and assimilate where it cannot create. The outcome of this autonomy is that the organism best fitted for survival becomes not so much that which has been naturally selected, as that which can best discover in its general environment those special features which will most adequately contribute to its life as a whole. Once this fact of autonomous selection has been recognised, this ability of the organism to cooperate with the life-enriching activities in the environment, an environment whose contribution becomes richer in proportion to the ability of the organism to assimilate, then the whole interpretation of evolution is radically altered. Man as the outreacher and responder and cooperator and assimilator par excellence, receives back

tenfold the dignity which he seemed at first sight to have lost. Evolution is not a 'chapter of accidents', sponsored by an arbitrary principle of natural selection. It becomes meaningful when its latest product, man, is ~~discovered~~ revealed as a ~~finder and a sharer of~~ creature who enjoys eternal values.

Furthermore, ~~there has to be~~ we have to reckoned with the profound truth that other means of survival than fitness for aggressive strife have proved highly successful. It now becomes possible to save one's life on a higher level by refusing to assert it aggressively on the lower. Biological evidence is not lacking to support the claim that individuals and groups have emerged victorious in the life quest by resigning a world which might have been theirs.

This we shall submit at a later stage, has been a vital factor in the upward climb of man, his readiness and his power to surrender present and temporary advantage for the sake of the future and the higher good. In this connection the Old Testament doctrine of survival through an obedient remnant opens up a criterion of survival value more illuminating than that of natural selection. Values may be achieved through surrender rather than through aggression. To live may be loss, whereas to die might be gain. To turn the other cheek commands a higher survival value than mere fitness to exist.

It was the mechanistic rigour of natural selection which lay so heavily on the minds of nineteenth century religious thinkers. In Darwin, man had been bold to claim that design was possible without the necessity of mind. Darwin assumed the fact of variation, which is obvious and undeniable, and that through the transmission of small chance variations an adaptation was attained which entitled its owner to survive. But it is manifestly incredible that such small variations, requiring to be accumulated and conserved throughout many generations, should occur in such a well defined directional series, culminating in a valuable end-product, simply on the blind principle of chance variation. Variability cannot be divorced from its complementary principle of 'subjective selection", as Ward called it, the organism's power to reciprocate with chosen features in its environment. The'natural' principle of selection is never isolated from psychic control.

Darwin, we have seen, did not himself uphold the all-sufficient efficacy of natural selection as a complete explanation of the evolutionary process. In a letter to Hooker, in 1844, he had insisted upon a distinction between his own interpretation of the method of variation, and that of Lamarck. Further study led him to revise his position and to include the possibility of the factor which he had at first rejected. Indeed he protested against those who misrepresented him to the extent of declaring that he

attributed the modification of species entirely to natural selection, and insisted that this principle was 'aided in an important manner by the inherited effects of use and disuse of parts'[i]. That is to say, he admitted the Lamarckian factor.

3. Huxley and Haeckel.

The logic of the Darwinian premises was carried to the illogical extreme of interpretation by Huxley and Haeckel. Thos. Henry Huxley, styling himself 'Darwin's bull-dog', championed evolution, and made it his work to popularise the Darwinian discoveries. He suceeded to a remarkable degree, expounding the evidence in 'Man's Place in Nature' and in a series of essays collected in 'Darwiniana'. The debate at Oxford, between Huxley and Bishop Wilberforce, with the resulting discomfiture of the latter, is typical of the triumph of evolution at this time.

It was in Germany, however, that the 'Darwinismus' cult prevailed most. In the 'Riddle of the Universe', Haeckel erected a thoroughgoing materialism on the base of Darwinism. Maintaining the unity of inorganic and organic nature he claimed that the spontaneity of the organism was simply a function of the chemical properties of carbon, and that through spontaneous generation, protoplasm in simple form

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i Origin of Species. ed. 6 p.421.

must arise from inorganic nitrogenous carbon compounds.

In the chapter on 'Darwin as Anthropologist'[i], Haeckel maintains that "the principle of evolution throughout the universe compels us to formulate a single supreme law, the all-embracing 'law of substance', or the united laws of the 'constancy of matter' and the 'conservation of energy'. We should never have reached this supreme conclusion if Charles Darwin had not prepared the way by his theory of descent by natural selection, and crowned the great work of his life by the association of the theory with a naturalistic anthropology."

Such dogmatic materialism is hard put to it to support itself today. Even if it were to be shown, and we are still far from it, that psychic properties arise directly out of chemical and physical media, the whole trend of modern physics is in the direction of confessing a 'principle of indeterminacy' in the original constituents of 'matter'. When this is supplemented by the biological recognition of the autonomous functioning of the organism, it is only sheer unscientific determinism which is able to deny the category of possibility as inherent in the very nature of life itself.

To recognise possibility is to discover the physical and chemical and biological correlate of what Christianity holds to be the core of the spiritual valuation of man.

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i. in 'Darwin and Modern Science' p.151.
2. see footnote on following page. 'Baly of Liverpool'

As a matter of fact,Haeckel's bark was worse than his bite,for we find him declaring that "to the two fundamental attributes..extension and energy,we now add a third,psychoma, sensitiveness or soul."[i] Surely here is a Haeckel come to judgment! The stalwart apostle of materialism once characterised Weismann's conception of the germ-plasm as 'mystical'. It would be interesting to be able to record a Weismannian verdict on Haeckel's'psychoma'.

To sum this matter up, there are important realms of real experience where natural selection is either non-operative, or else functions only in the presence of equally powerful psychic factors. Natural selection cannot create the material upon which it works; its nature is to prune rather than to produce;but in the fact of productivity lies the real creative genius of organic activity. As we advance up the ladder of life we find natural selection a factor of decreasing importance.Its function cannot be separated from processes which include a vital as well as a mechanical efficacy. The tendency to vary, the urge of heredity, the attraction to creative expression, the behaviour of the organism as a unit, none of these are

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i. Darwin and Modern Science. p.142.
Baly of Liverpool claims that in the presence of light, moisture and carbon-dioxide, he has produced formaldehyde and sugar at the surface of certain inorganic compounds. i.e. he has suggested how we might imagine certain organic substances to have been produced from the inorganic. He has so to speak,reconstructed the first steps which go on in the cells of plants in producing fructose.
It must not be overlooked however that in all such work there is behind the experiment the deliberate functioning of a creative and organising mind,guaranteeing and relating the conditions necessary for the 'emergence'.
Moreover, formaldehyde is not personality.

translatable into mechanical or natural categories, and these are always involved in any situation where natural selection operates. These represent the internal, as complementary, though not opposed to, the external factors of evolution.

Finally we repeat that natural selection is practically quiescent when man emerges from the level of mere existence into the deliberately selected life of the spirit, in which he discovers his true worth. Sorley well argues that 'it is not owing to, but in spite of natural selection that the mind of man affirms its unity with truth and beauty and goodness, and undismayed by opposition seeks its home among ideals."[i.] Beyond the restricted operation of natural selection there is possible to outreaching humanity an interlocking spiritual reciprocity with the environment which fully vindicates the Christian valuation of human worth without exposing it to the dangers attendant upon abstracting man from the natural order to which he is organically related.

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i. Sorley W.R. Moral Values & the Idea of God. p.326.

4. Weismannism. Its significance for Human Values.

With the widespread acceptance of Darwinism, it became increasingly clear that the main struggle for human values was to be between the older Lamarckian interpretation, which relied upon the presence of a teleological factor without which there could be no real evolution, and the NeoDarwinian school which insisted that organic evolution was governed throughout wholly by mechanistic principles. Huxley denied what Lamarck had maintained, the fact of the transmissibility of acquired characteristics. Weismann set the seal of experimental approval on the denial of Huxley. Lamarck in substance had argued for a complementary relationship between organism and environment, with due recognition of the part played by each. Weismann now declared that the environment played no part in evolution, that the mechanics of development were regulated wholly from within the organism itself, and that on strictly mechanistic lines.

Towards the end of the 19th century he advanced his famous theory of the continuity of the germ-plasm, as the result of his experiments with Hydromedusae. Galton had previously shown that 'in development the bulk of the germinal material of the fertilised egg-cell goes to form the 'body' of the embryo...but a certain residue is

kept apart from the development of the 'body' to form the primordium of the reproductive organs of the offspring, whence will be launched in due time another similar vessel on the adventurous voyage of life".[i] Following up this important generalisation, Weismann made a rigid separation between these two functional aspects of the germ plasm, maintaining that the reproductive portion of the germ-plasm preserved its own uninterrupted continuity of existence from generation to generation, inviolate, wholly unaffected by any influence that might reach the 'body' part of the developing orgahism. No matter what adaptation the 'body' was required to make by the environment, the inherited part of the germ-plasm remained always what it had originally been, from generation to generation. "The continuity of the germ-plasm is founded upon the idea that heredity is brought about by the transmission from one generation to another, of a substance with a definite chemical, and above all, molecular constitution. I have called this substance 'germ-plasm', and have assumed that it possesses a highly complex structure, conferring upon it the power of developing into a complex organism. I have attempted to explain heredity by supposing that in each ontogeny, a part of the specific germ-plasm is not used up in the construction of the body of the offspring, but is reserved unchanged for the formation of the germ cells of the following generation"[2]

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i. Thomson J.A. System of Animate Nature vol.2. p.480
2. Weismann A. Essays upon Heredity. vol.1. p.74

Once granted this assumption of the segregated germinal continuity, it was a logical step to assert that in the 'germ-cell' there were to be discovered the factors which governed the transmission of inheritance. Weismann further maintained that apart from possible re-shuffling of the original deposit of chemical determinants no new hereditary variants could appear. Hence, if true, Weismannism imposed upon the Christian doctrine of man a biological necessitarianism from which theoretically there seemed to be no escape.

For religious values the implications of this rigidly deterministic schema were far reaching. In the first place, the contrast between the immortality of the germ-plasm, and the evanescence of the body-plasm was absolute. The only value seemingly left for the individual was to provide a convenient means of protection and nourishment for the germ-plasm.

More significantly, Weismannism implied that man could not detach himself from the natural rock whence he was hewn. The germ-plasm of the fathers was visited upon the children, not only unto the third and fourth generations, but ad infinitum.

In its practical day to day field work, Christianity had operated on the faith that the environment did make its impact upon the life of the individual, for good or for bad, and that man had within himself the ability to throw off the 'old man', in response to the challenge of the 'new

creature'. It was part of the considered policy of religion to seek those ameliorating and invigorating elements of environment which would call forth the finer functionings of the spirit of man in response to these conditions. But if the body and the transmitted life were to be ~~compartmented~~ segregated in Weismannian fashion, the enrichment through external environment was of no use so far as entailing the spiritual experience was concerned. All that could be expected was temporary alleviation of faulty adaptation, each generation beginning patiently at the beginning. Certainly there was no possibility of stimulating the evolution of a better stock, for the initial constituents of the germ-cell had pre-determined what the stock should be, and no outside influence could reach the original deposit.

Religion, through this new devaluation of human values, was assailed at the heart of it.

The most far-reaching implication of Weismannism, for religion, was its negation of human freedom. On the assumption of the initial packing of the germ-plasm, all spontaneity and freedom and possibility were necessarily ruled out. Henceforth religion was in the hands of Ecclesiastes. "The thing that hath been, it is that which shall be, and that which is done is that which shall be done; and there is no new thing under the sun."[i] Man was simply bread in the hands of the baker; kneaded and moulded by a divine workman who supplied the flour and the yeast which enabled it to rise. If the yeast were bad, the inheritance faulty, then there was no escape from its

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i. Eccles. 1. 9.

foreordained consequences. By wrestling with the powers of evil man could never hope to alter the original character of his makeup or pass the increments of experience into an altered race. "He that is filthy, let him be filthy still" took precedence over 'Whosoever will,may.' Weismannism denied what Christianity cherished, the possibility of creative cooperation between the individual and his environment resulting in enhanced personality,and it also took away any hope of handing on to succeeding generations the benefits of any acquired experience.

But the sting of Weismannism has been withdrawn. In the first place, the separation between the germ-plasm and the body-plasm has been grossly overstated. Weismann himself did admit that the effects of alcohol and syphilis could reach the germ-plasm and be transmitted to offspring. So far is it from being true that the germ-cells live a life apart from the general life of the organism as a whole that 'every cell of the body and every chromosome and chondriosome factor is...a centre of bio-chemical influence to which other cells and chromosomes respond in their mode of action...there is a transfusion of their bio-chemical products; hence every cell is...steeped in a'bio-chemical brew' of bewildering complexity..and the germinal cells, no less than the somatic cells, are steeped in this bio-chemical brew".[i]

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i. C.L.Morgan. Evolution in the Light of Modern Knowledge.157-8

Experimentally it has been demonstrated that "when both ovaries, their capsules, portions of the Fallopian tubes, the fat bodies, and portions of the surrounding tissues are removed from adult mice, new ovaries containing new sex cells may be developed. These new ovaries perform their normal function of reestablighing the oestral cycle, even leading to normal pregnancy."[i] Obviously, in the face of such facts it is impossible any longer to maintain the isolation of the germ-cells.

Again, the discovery of the pervasive functioning of the hormonic elements associated with the endocrine or ductless glands is but one more testimony militating against any other interpretation of the organism except as a unity. It is no longer sound biology to regard the organism as a composite of isolated fragments. The functioning of every part is vitally related to the functioning of the whole. This doctrine of wholeness is as vital for the Christian doctrine of human worth as it is for biology.

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i. Proc. Roy Soc. 1927. Series B. vol 101. No.710 p.31.

5. The Inheritance of Acquired Characteristics.

Today there is a constantly increasing weight of evidence in favour of the Lamarckian doctrine of the transmissibility of acquired characteristics. The repudiation of Weismannism proceeds apace. Kammerer of Austria, whose work was cut short by a tragic suicide, advanced experimental evidence in his observation of the salamander. MacBride sums up his own conclusions regarding this experiment as follows. 'The animal responds to a change in environment by an alteration in the proportions of its pigment; this response produces an effect on the offspring, so that they tend to start ~~eff~~ where their parents left off."....."The results of Kammererxs have been entirely confirmed by the completely independent work of Durkhen on the cabbage white butterfly"[i] Both of these workers are in agreement with the experiments of Pavlov on mice. MacBride continues"we consider that these results of Kammerer and Durkhen are literally epoch making for the theory of evolution.....the mainspring of evolution,as Lamarck said over a hundred years ago is the response of the animal to its environment"[2]

Bower describes a remarkable case of inherited adaptation in the ferns,'the shifting of the sorus from the margin of the sporophyll....to a place on its lower surface".[3]

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i. Evolution in the Light of Modern Knowledge. p.241.
2. ibid. p.242.
3. ibid.p.198.

He concludes, that 'this change...suggests very strongly an inheritance of a character that has been adaptive, acquired in inceasing intensity by two successions of individual lives."[1]

Dr Adami has demonstrated that even among the bacteria acquired properties of certain orders are inherited through numerous generations.[2]

An experiment which is very significant for the inheritance of acquired characteristics is described by Harrison in connection with the egg-laying instincts of a gall-making saw-fly. Consequent upon a change of food plant, not only the appearance but also the behaviour of the sawfly was modified, and more significantly,both the structural and the functional alterations were passed on to succeeding generations. A new egg-laying habit was acquired and germinally fixed, leading Harrison to the conclusion that in this experiment'we are thus dealing with an incontrovertible case of the inheritance of acquired characteristics".[3]

We have been at pains to make a critical examination of the Weismannian hypothesis; our main object in so doing was to emphasise the fact that the living organism is not primarily a 'spatially distributed material structure' but a creatively functioning unity, vitally in touch with a living environment, able to reach out and absorb vitalising

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1. Evolution in the Light of Modern Knowledge. p. ~~198~~ 106.
2. Medical Contributions to the Study of Evolution p.70
3. Proc. Roy. Soc. 1927 B. vol.101 No.707 p.115 ff.

sustenance from its environment, and to pass on at least some increments of experience. It may be-as Ward maintains-that the repetitions which will suffice to make'use' a second nature, or a habit automatic for a lifetime,are very far from sufficing to ensure heredity for future generations, yet "unless the facility and familiarity acquired in a single lifetime are transmitted-it may be in infinitesimal degree-there could obviously be no transmission at all"[i]

The religious man who has taken a good look at nature, both human and cosmic, is not dismayed by the element of time involved in progress. Progress, if it has any element of necessity at all, is necessarily slow. Any fair-minded view of life must see all things'sub specie aeternitatis'. But the worth of human life is negated entirely unless we are sure that we are making some gains and conserving them, and transmitting valuable experiences learned in our own adjustments. The religious man has always believed this to be the case. He welcomes whatever approval evolutionary biology can bring to his intuitions. But he will not allow that biology has the last word in this or any other realm of experiential values when the category of personalityy is involved.

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i. Ward J. Psychological Principles. p.427.

6. The attempts to explain Memory.

By his uncompromising assertion of the chemical constitution of the germ-plasm, Weismann had made the issue quite clear, although he was compelled by the logic of his thesis to posit in the original stuff of heredity a complexity of structure and function which seemed mystical even to Haeckel. It was inevitable then, that attention should come to be concentrated in a problem which called for solution in connection with the method of the germ-plasm's functioning in heredity.

Between the organic and the physico-chemical interpretations of evolutionary change lay the difficulty of memory. If there was continuity of experience from one generation to another, some explanation must be sought for the manner of transmission.

The first coupling of development with memory was made by Ewald Hering in Germany. Samuel Butler, working independently in England, attacked the same problem in a different fashion.

Butler.

Butler's theory of memory and heredity is significant for its radical break with the methodology of his day. For Butler, memory is heredity. Neo-Darwinism had insisted that heredity could be explained only through material structures. Butler maintained that the problem

called for a psychological solution. Stressing the rôle of habit in individual development, he argued that habit sustained throughout many generations finally eventuated in the perfection of unconscious automaticity. ~~Applying this to~~ In the case of the developing embryo it would seem that the growing organism's sense of its direction in development was likewise unconscious automaticity, achieved through countless previous repetitions. Hence it appeared that there was a real continuity of experience between parent and offspring which reached right back to the beginnings of life. "The successor is bona-fide but a part of the life of his progenitor, inbued with all his memories, profiting by all his experiences-which are in fact his own- and only unconscious of the extent of his own memories and experiences owing to their vastness and already infinite repetitions"[1].

In 1887, Butler gave more specific articulation to his theory, maintaining that 'the race is one long individual, living indeed in pulsations, so to speak, but no more losing continuous personality by living in successive generations than an individual loses it by living in consecutive days"[2]. In other words, not continuity of the germ-plasm, but continuity of real experience furnished the key to the riddle of heredity.

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1. S.Butler. Life & Habit. Fifield reprint. 1910. p.50
2. do Luck or Cunning. Fifield 1909 p.25

Butler's viewpoint,however,failed to commend itself to the scientific opinion of his day. To admit memory,and hence psychology, into heredity, was biological heresy in the nineteenth century.

But for once the intuition of the amateur prevailed over the generalisation of the expert. The validity of Butler's intuition was strikingly sustained a few years after his death-he died in 1902-when Sir Francis Darwin,in a Presidential Address, held it to be consistent with the doctrine of continuity that in all living things there is something psychic. "As the ovum develops into the perfect organism it passes through a series of changes which are believed to represent the successive forms through which its ancestors passed in the process of evolution. This is precisely paralleled by our own experience of memory."[i]

It was but a few years after this that philosophic support was to be forthcoming from the pen of James Ward for the part played by the psychic factor in development.

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i. British Association Report. 1908. pp.1-27

Ewald Hering.

Hering linked heredity with memory from the viewpoint of the physiologist. He gave full recognition to the fact that in the organism there is a psychic as well as a physical phase; but as a physiologist he felt bound to seek interpretation through the material structure. The psychologist was equally free to interpret his data through the psychic categories.

In the conscious activities of the organism, Hering was confronted with memory and habit, these not being discoverable in the material structure. On the other hand, it was obvious that memory itself is not always conscious- witness the break in conscious continuity which occurs between the sleeping and the waking condition. Part of the experiential bond of continuity then is in the unconscious, and "we know nothing of this except what we learn from our investigations of matter; and since in a purely empirical consideration,matter and the unconscious must be regarded as identical, the physiologist may justly define memory in a wider sense, to be a faculty of the brain, the results of which to a great extent belong to both consciousness and unconsciousness."[i]

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i. Memory. Open Court Publ. 4th ed. p.9.
1913. Chicago & London.

Thus, for Hering, memory depends upon a material impression made upon living matter, by the original situation, which is later 'remembered'. "After the extinction of conscious sensations, some material vestiges still remain in our nervous system, implying a change of its molecular and atomic structure, by which the nervous substance is enabled to reproduce such psychical processes as are connected with the corresponding physical processes of sensation and perception."[i] Memory is regarded as a property of organised matter.

Richard Semon.

This skeleton of the mnemic theory, articulated by Hering, was clothed with flesh by Richard Semon. But the corpse still lacked the pulse of life. Semon presented biology with a new vocabulary, but his approach to the problem of memory is merely an elaboration of the fundamental ideas of Hering.

For Semon, organised matter is characterised by the 'mneme', in all of its reproductive processes, including memory, heredity, or habit-even the ontogenetic functions. In virtue of this mnemic property, the organism

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i. ibid. p.7.

is able to retain the effect of stimuli as 'engrams' which may be revived under suitable conditions.

The first law of 'the mneme' is that "all simultaneous excitations within an organism form a coherent simultaneous excitation-complex, which acts engraphically; that is, it leaves behind a connected engram-complex constituting a coherent unity."[i] Subsequent stimuli of a similar or associated kind elicit an 'ecphoric' response of the 'whole simultaneous engram-complex'.

The mnemic property of the organism is, of course, construed in purely physiological terms. Moreover, since the mneme operates over all reproductive processes, the engrams, together with their associational complexes, are stored in the germ-cells, as well as in the brain, thus making it possible for the impress of experience to be transmitted to offspring.

E. Rignano.

In 1906, the engram theory was rigorously elaborated by E. Rignano, in an ingenious attempt to discover a physical foundation for the facts of memory. Underlying Rignano's theory there is the assumption that the stream of nervous energy in organisms is of many

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i. R. Semon. The Mneme. p.273.

specific varieties, and closely analogous to the flow of energy in an electric current. Locating his 'accumulators' in the material structure of the brain, Rignano contended that "the specific potential elements"through which the 'mnemonic property'functions, are "accumulators of specific nervous energy-or specific elementary accumulators". "In the capacity of restoring again the same specificity of nervous current as that by which each element had been deposited, one would look for the cause of the mnemonic faculty in the widest sense, which all living matter possesses...The very essence of the mnemonic faculty would consist entirely in this restitution."[1]

But no such "specific nervous energies" have ever yet been revealed by physiological experiment. The relation between nervous energy and electrical energy does not proceed by analogy into identity.

Moreover, it is pertinent to remind ourselves, when considering all 'engram' and 'accumulator' theories, that while these may afford a plausible explanation for the preservation and reproduction of actual sense impressions, or their'associational complexes', they can never account for real memory,which has to do not so much with actually reproduced sensations as with the meanings of these. And

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i. E. Rignano. Upon the Inheritance of Acquired Characteristics. Trans. Chicago1911.

as McDougall has pointed out, 'meaning' as such, is not represented by any particular physiological correlate in the material structure of the brain.[1] Meaning is a function of the total psychic activity, rather than a specialised function of specific matter. Furthermore, memory differs from the re-induction of previously captured sensory traces in that it implies the activity of an integrated self, capable of identifying and of focussing attention upon a'remembered' experience, selected out of the past, and at the same time considered in relation to it. Memory is inexplainable apart from the psychic unity of the experiencing organism.

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In later works, Rignano advanced the thesis of 'affective tendencies' in an endeavour to explain teleological activity on mechanistic grounds. Every affective tendency in the organism is to be explained on the basis of a general tendency''to maintain or restore its stationary physiological state' Organisms have a tendency to restore their condition of chemical equilibrium after disturbance, and all actions are incidents in such disturbance. "This property constitutes the foundation and essence of all 'needs', of all 'desires', of all the most

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1.Body & Mind. p.311.

2.Psychology of Reasoning. London 1923.

important organic 'appetites' . For Rignano, this 'complacency tendency'[2] as Raup has called it, is interpreted wholly in physiological terms, but it is obvious that the mechanical categories have been filled up with life. Addressing the psychological section of the British Association in 1926, Rignano suggested that there should be postulated in living organisms a peculiar form of physical energy that operates teleologically.

W. R. Bousfield.

The logical terminus of the attempts to explain memory on a physical basis would seem to have been reached in the theory of W.R.Bousfield.[1] In his search for the basis of memory, Bousfield is driven to postulate a factor which is 'physical though immaterial'. Confessing the insufficiency of 'engrams' 'preserved in protoplasmic structure' to account for the psychic side of memory, he proposes that 'we must examine the alternative hypothesis of traces in psychic structure'. This in turn means that we must 'abandon our natural prejudice against recognising something which our senses do not reveal to us'. Hence, for Bousfield, memory is possible not as an 'engram' record, preserved in protoplasmic structure, but a 'psychoplasm' , preserved in an 'immaterial' structure, on the ground that

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1. W.R.Bousfield. The Mind and its Mechanism. London 1926
   do. The Basis of Memory London 1928
   The theory is expounded in both works.
2. Complacency, the Foundation of Human Behaviour. New York. 1925

"every living cell has not only a protoplasmic structure, which is the material basis of life, but also a psycho-plasmic structure, which is the basis of psychic life, capable of being affected by psychic factors and of retaining mnemonic traces."[i]

It would seem then that in this region of evolutionary biology we discover an increasing tendency towards recognition of the psychological factor, and a decreasing tendency to equate human worth to the level of the physico-chemical. Should this line of approach to the problem of memory and inheritance prove fertile it will have great significance for the Christian interpretation of man. It is never the strategy of wisdom, of course, to build too much or too soon upon tentative hypotheses in any science, but if the biologist is not afraid to speak of the possibility of the survival of mental experience through the medium of an "immaterial" "psycho-plasmic" structure, we see no reason why Christian philosophy should retreat from its fundamental intuition that human personality has profound survival value apart from its temporary present embodiment in a 'proto-plasmic structure' . Christian theory asks for nothing more hopeful than a searching out of the whole truth that can be discovered in every segment of the total life experience. It is pledged to wholeness in the

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i. The Basis of Memory.

search for that truth which alone can establish its values, and at its best it will always insist that the enduring values of personality are discoverable in terms of the living whole. The strength, and therefore the weakness, of all mechanistic interpretations lies in a faulty abstraction from the wholeness of the life function.

The analysis of a unit into its component parts is legitimate only when the analyst remembers that he has temporarily ignored the most important characteristic of his object of analysis, namely its functional unity.

For Christian theory this functional itself is inexplicable apart from environmental affinity.

7. James Ward. Recognition of the Psycho-biological Schema

A decisive recognition of the psychological factor involved in all evolutionary change came from the pen of James Ward. In his Gifford Lectures 'Naturalism and Agnosticism", published in 1899, Ward broke a lance with biological theory for its neglect of the active agent, which is the really significant factor in all change. Granted that an organism lives and moves and has its being in a generalised environment, nevertheless 'special environments are singled out by different individuals from the general environment common to all"[i] This teleological selection is always at work, determining definite variations as distinct from fortuitous ones,'definite in the sense of bringing the individual into closer rapport with that portion of the general environment which it is selecting" The agent is real; he makes a real selection, and the selection involves a living relationship with a value-sustaining environment. Organism and environment are as strictly correlated in biology as subject and object in psychology.

Biological experiment has amply confirmed the claims of Ward that a psychic factor is always at work in the developing organism. Consider for instance the new

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i. Naturalism & Agnosticism. vol.1.p.295

understanding of the facts of embryonic development, stimulated by the work of Roux, and amply confirmed by Speman and Harrison. Roux made it clear that development is characterised by two stages; an earlier, when the sheer inheritance of the embryo seems to predominate, and a later, when the embryo asserts its a-utonomy, shaping its inheritance in accordance with its own requirements.

Harrison, following this lead, demonstrated the facts clearly by his experiments with limb-bud grafts. When the limb-bud of one embryo was grafted upon another embryo, in the early stage, the host embryo took over the control, to the extent of developing into a normally dispositioned limb, a grafted bud which had been rotated through an angle of 180 degrees. The host even took over the development of an engrafted forelimb bud and transformed it into a hind limb. But at a critical stage of embryonic development, the limb-bud will have so asserted its own autonomy, that when grafted on to its host, the graft takes control of its own development, the power to organise life being henceforth vested in its own individuality.[i]

The developing organism has its own real part to play in its relation to its environment. It responds as only it can, and the measure of its power to respond increases in proportion to its scale of development. Hocking states the case well when he declares that "no account of the philosophy

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i. for similar experiment by Speman c.f.
Proc. Roy. Soc. Dec. 1927. Series B.vol.102. No.716. p.177

of change is complete which refers it alone to the elan vital with its perpetual creativity, nor yet to the Unmoved Mover that beckons all men to its absolute good. To these must be added the driving power of the standards or systems which are due to the action of the human analysis and concept making".[i] The organism is no mere puppet of circumstances, but an entity,'capable alike of an ever more definite individuality and of ever more complex interaction with its surroundings and its fellows."

The Christian philosophy of man can well afford to endorse such admissions of the genuineness of the part played by the creature in the cosmic activity; it need never cross swords with a psycho-biological interpretation which so guarantees the worth of human personality. Yet in witholding its hand,it will also reserve the right to maintain that the psychobiological category of organism and environment is not in itself exhaustively explanatory of the experiential relationship between man and his environment,or his God. For man receives as well as gives, and Christianity in its valuation of human worth is persuaded that the richest phase of the human-divine experience is the contribution of the divine. Yet even this aspect of organism has received an ungrudging admission from biology."The doctrine of the

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i.Human Nature and its Remaking. p.348

philosophy of organism is that however far the sphere of efficient causation is pushed in the determinations of the components of a concrescence, its data, its emotions, its appreciations, its purpose, its phases of subjective aim... beyond the determination of these components there always remains the final reaction of the self-creative unity of the universe. This final reaction completes the self-creative act by putting the decisive stamp of creative emphasis upon the determinations of efficient cause. Each occasion exhibits its measure of creative emphasis in proportion to its measure of subjective intensity. The absolute standard of such intensity is that of the primordial nature of God."[i]

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i. Whitehead A.N. Process & Reality. p.65

8. Continuation of the Mechanistic Interpretation.

Our interest in following the growing recognition of the psychological factor in development has temporarily diverted our attention from an antagonistic phase of the evolutionary story which must now be dealt with.

Darwin's ultimate explanation of evolution tended towards a belief in fortuitous variations occurring in every direction in every part of the organism. Upon the material thus supplied to it, natural selection operated, with the consequence that fortunate characters were preserved, and perpetuated.

Darwin, at the same time, had recognised the existence of so-called 'sports'.[i] These, although useful to the artificial breeder of plants of animals, seemed to Darwin to play a very minor rôle in evolution. It was his opinion that such divergent types would soon lose their identity by cross-breeding with more typical forms.

But the stone thus rejected was to become the head of the corner. Soon this question of 'discontinuous variations' or mutations, was to loom up as important for the theory of evolution.

To Bateson is chiefly due the credit for focussing the attention of English workers upon this phase of evolution.

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i. c.f his list of instances in
Animals & Plants under Domestication. Vol.1. ch.3.

Mendel.

Contemporaneous with the work of Darwin, important discoveries were being made in a monastery garden at Brünn, in Austrian Silesia. Gregor Johann Mendel, Abbot of the Augustinian Order, patiently experimenting with the hybridisation of plants,had come near to discovering the secret of the differentiation of species. The results of his labours, now seen to be momentous, were overlooked in the general triumph of the Darwinian interpretation. Hidden for thirty years,in the monastery records, they were finally brought to light in the year 1900.

By crossing two pure strains of the edible pea,a tall and a dwarf variety, Mendel was able to show that the offspring of these pure strains, when permitted to self-pollinate, proceeded in a definitely calculable ratio, along the now well known lines of "Mendelian Inheritance." The results of Mendel's work are established in the principle of segregation, and the theory of unit characters. That is to say, in development, the particles of the germ-plasm, which are credited with being the bearers of the characters to be inherited, do not fuse, but retain their integrity as units, with the result that such characters, instead of resulting in a 'blended inheritance' or 'fusion of characters', are passed on as units or wholes. The tall and the dwarf peas in Mendel's experiments did not give rise to mediums, but only talls and dwarfs. A cross might show characters which belong to both parents, or to either parent, but

characters which are inherited are received in their entirety, or not at all. "Underlying the whole conception, is the intuition that sets of related characters are determined by the germ-elements, the most prominent of these characters being noticed by the observer.'

De Vries;

Side by side with this discovery of Mendel's work came the announcement of the mutation theory by De Vries, a Dutch naturalist. Darwin assumed that species evolved by the slow selection of favorable variations in a field of minute fortuitous variations. De Vries now maintained that 'species originated suddenly, through the occasional appearance of definite discontinuous forms, independent of the Darwinian variations', these new departures being transmitted to offspring. His studies of the evening primrose had convinced De Vries that there were two kinds of variations to be distinguished, the small indefinite differences between individuals, 'fluctuations', and the definite changes which seem to appear suddenly, 'mutations', these being also heritable. In the mutations thrown off by the evening primrose, De Vries had caught evolution in the very act.

The conjunction of Mendelism and Mutationism, following hard on the triumph of Weismannism seemed to mean the complete submergence of the Lamarckian factor. It now appeared to be proved that the environment played little

or no part in evolution. Weismann had insisted that the character of the individual was determined wholly by the make-up of the fertilised egg, hence variability of character was restricted to the narrow confines of the original deposit of inheritance donated by the parent organisms. Mendel had demonstrated the rigidity of the laws of inheritance and De Vries[i] had shown how evolution occurred. The consequences for human values seemed disastrous.

The Chromosome Theory.

If anything else were needed to bind the bonds of affinity between the conclusions of Weismann and De Vries and Mendel, it came with the elaboration of the chromosome theory. Patient observation of the minute movements

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i. De Vries like Weismann, reduced the elementary properties of organisms to material particles or 'pangens'. The diversity of organisms was due to the great variety of possible combinations of the 'pangens'.

For a very cogent criticism of this molecular trend in biological interpretation, see the chapter on 'Misuse of Abstraction' in The Interpretation of Development & Heredity. Russell. London 1930.

of the cell led to an abandonment of the 'germ-plasm' and pointed to the conclusion that in fertilisation the mating chromosomes contain the physical units or 'factors' or 'genes' which explain Mendelian inheritance. "Sutton... showed that the formulas of Mendelian heredity generally(as then known) could be applied without alteration alike to the hypothetical'factors' or 'genes' and to the chromosomes, and that the combinations, segregations, and recombinations of the former are paralleled by those of the latter."[i]

Hence the Mendelian laws of inheritance found their material basis in the assumed'actual'physical entities in the chromosomes.

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i. E.B.Wilson: The Cell in Development & Heredity, New York. 3rd ed. 1925. p.926.ff.

Crew F.A.E. defines the gene as "a particular state of organisation of the chromatin at a particular point along the length of a particular chromosome. It is a particular area or locus of the chromosome in a particular state. One particular condition of this chromatin can be replaced by others and with each change another gene appears." Nature Nov.19.1927.p.733

T.H.Morgan[i] and his pupils, enthusiastically experimenting with the conveniently mutating fruit-fly, 'Drosophila', soon established the facts of 'linkage', showing that certain inherited factors were coupled together, entering a hybrid together and leaving it together. Side by side with the work of Morgan on 'Drosophila', go the equally important experiments of Mrs Sexton, of Plymouth, on a species of crustacean whose first mutation was recorded in 1913.

The final elaboration of the theory of the gene is clearly stated by Julian S. Huxley. "The hereditary constitution of at least all higher organisms consists of a number of units-factors, or genes-, each of which may exist in a number of forms-allelomorphs; these genes exist in definite proportions, and are arranged in a definite order; the whole gene-complex is divided up among the separate chromosomes, which in Drosophila have been shown to correspond to the linkage-groups established by genetic experiments."[2]

It seemed then that the problem of heredity had finally been solved,[3] and on a mechanistic basis.

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i. T.H.Morgan. The Theory of the Gene. New Haven. 1926.
2. Nature. Dec. 25th 1926. p.903.
3. T.H.Morgan. Critique of Theory of Evolution.p.101 (but Morgan does not claim that the mechanism of the chromosomes explains the origin of the genes or <u>how</u> they influence development.)

Criticism of The Mechanistic Movement in Biology.

It would be extremely interesting, and we believe, highly instructive, to trace in minute detail all the ramifications of this molecular trend in the science of biology, which started out so bravely with the 'life-wholes' of Aristotle, and culminated in the 'genes' of 'Drosophila'. How did so radical a change of view become possible?

We note, only in passing, two significant factors in the process-the establishing of a mechanistic view of the universe in the seventeenth century, as the result of the researches of Kepler, Galileo and Newton, supplemented by the philosophy of Descartes-and the exploitation of the microscope.

A mechanistic universe inevitably led to a mechanistic conception of the organism. The life-wholes became machines, whose actions were dependent upon their structure. The invention of the microscope made the analysis of the structure itself possible, and 'the mind, full of the great microscopic discoveries of the time, was carried away by its own inertia..outrunning the instrument, first dreamed of and then believed in the existence of structures too minute to be revealed by the available lenses."[i]

Not even the biologist can escape the universal tendency of the human mind to go beyond the seen to the unseen for an interpretation of the empirical facts of life.

This attempt at the quantitative analysis of the germ-plasm is more or less analagous to the progressive reduction of 'matter' to molecules. Underlying both movements

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i. c.f Wheeler W.M.'Caspar Friedrich Wolff and the Theoria Generationis' Boston 1899 p.270ff
for an acute analysis of 'mind types' and the kind of interpretation to which they are drawn;
Woods Hole Biological Lectures for 1898

there is the assumption that the respective substrata of biology and physics are capable of reduction to atomicity[1] in units whose occurrence and combination may be predicted on a mathematical basis.

But physics finds itself baulked by the problem of quanta from asserting predictability[2] in connection with the atom or the electron. The same element of indeterminism and indirection applies to predictability of the Mendelian character of the individual. Statistically we may predict averages, in either case, with a fair degree of probability, but life is more than statistics, and individuals more than probable averages.

If we are at all statistically impressed, the possible number of combinations open to the mating sets of twenty-four human chromosomes is enormous. Even on a strictly statistical basis there is little room for a rigid doctrine of biological necessity. Actually, the individual is unique. Nature never duplicates.

It is admitted now that there are plenty of cases where the Mendelian formula does not apply, or where it has to be supplemented by additional hypotheses. For instance, "in certain cases of the Lepidoptera, the law of alternate inheritance"[3]

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i. "The genes are purely hypothetical units-fictions invented to account for the very complex hereditary behaviour of mutant characters in Drosophila. As such they have a certain interpretative and heuristic value, provided their purely conceptual and hypothetical character is clearly borne in mind". Russell. Interpret.of Devel. & Hered.p.62
2. Eddington. The Nature of the Physical World. p.294
3. Raven C.E. The Creator Spirit. p.54

could not be reconciled with results." A statistical survey of a long series of experiments with peas showed that while Mendelian proportions were in many cases'close approximations to the truth, there was a noticeable and constant error; and this taken together with the admitted exceptions compelled the belief that thoughx a useful guide to the farmer, the theory"is inadequate completely to explain all the facts"[1].

But a more discriminating criticism of the Mendelian mechanism rises out of the modern hesitancy to accept anything less than the principle of wholeness as a norm of interpretation. Weismannism is rejected for its artificial segmentation of the vital components of life. It is also legitimately urged against Mendelism that it violates the principle of functional unity. This difficulty was clearly envisaged by Johannsen, the originator of the term'gene' when he declared,"We are far from the ideal of enthusiastic Mendelians, viz, the possibility of dissolving genotypes into relatively small units, be they called genes,allelomorphs, factors, or something else. Personally I believe in a great central'something' as yet not divisible into separate factors"[2]

Present day biology, with its trend towards functional synthesis despairs more and more of ever being able to cage this central'something' in schematic categories.

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1. Journal of Genetics. Vol.XIII pp255-331.
2. Russell. The Interpretation of Development & Heredity.p.64

The strict interpretation of the gene theory further violates the principle of wholeness when it acts upon the assumption that the influence of environment is nullified in heredity.[i] This assumption is the inevitable consequence of 'piece-mealing' the organism, forgetting that organism and environment are inseparable. A survey of international opinion recently showed that environment must be regarded as "at least co-equal with heredity,"[2] in its contribution to development.

Interpretation of the gene, however is changing. It seems now that "the effect of a gene depends not only upon environmental conditions, but also, and particularly, upon the other genes with which it is associated in the hereditary constitution of the individual."[3] The Aristotelian interpretation through life-wholes is on the way towards rehabilitation.

The chromosome theory has been carefully examined by Wilson, who concludes, "the egg is a reaction system".. "the whole germinal complex is directly involved in the production of every character".."the organism as a whole is always involved."[4]

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i. "it looks at first sight, as if a physical object, with its process of inheritance from itself, were independent of the environment. But such a conclusion is not justified." Whitehead. Science & the Modern World. p.159
2. Quart. Rev. of Biol. Sep. 1930 Vol.v. No.3.
3. Crew. Nature. Nov. 19. 1927. p.733
4. The Cell in Develop. & Heredity. p.976. 3rd ed. 1925.

The practical efficacy of the Mendelian formula is of course not denied. Our point is simply this, that in its analysis of character and human values, Christian theory is bound by its method of interpretation to insist upon wholeness. Whenever the eternal values have suffered eclipse, this has been the direct result of an emasculated interpretation of the facts of life. For Christianity, no fact is finally explained except agsinst the backgrdund of cosmic experience.

The Mutation Theory. Importance of Principle of Interpretation.

The question of mutations remains to be considered. De Vries has shown that "in mutation the parent plant held to its type all through, but might give rise again in a discontinuous manner to various kinds of new forms, differing qualitatively from it, which were more or less fit to survive than the parent form, and if fit, remained true to their type."[i] From these transmitted mutations, it was held that new species came into being, in contrast with the slow evolution assumed by Darwin.

Now the fact of mutation itself is not to be denied. Many biologists, however, while admitting the

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i. The Spiritual Interpretation of Nature. J.Y.Simpson.p.152

facts,hesitate to attribute to mutation such an all important function in evolution as the origin of species,claimed by de Vries. Others again frankly maintain that mutations are a symptom of disease rather than a normal type,and as such disclaim them. MacBride supports the 'pathological' interpretation,and quotes with approval Tornier's experiment with Chinese goldfish.[i]

Tornier discovered that the artificially bred grotesque varieties of goldfish were the result of deliberate exposure of the developing embryo,by the breeders, to insanitary conditions, lack of oxygen, etc. This resulted in a 'weakening of the germ plasm', together with a tendency for that weakening to be localised in a particular part of the germ; hence the consequent'pathological' mutation with respect to the tail, eye, fin, etc of the goldfish. On the strength of this,MacBride concludes,'This strikes a deadly blow at the mutation hypothesis....it is true that many of them are useful to man,but from the viewpoint of the animal, pathological monstrosities"....."If mutations are the outcome and visible signs of an inner germ weakening,they can have played no part whatever in evolution, for in wild nature they would at once have been eliminated by natural selection."

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i. Evolution in the Light of Modern Knowledge. p.232.
(This experiment is rigidly criticised by Cunningham in Modern Biology. p.84-96.)

This seems to us too sweeping a generalisat-ipn to be based upon an admitted experiment in pathology. From abnormal conditions one may look for abnormal results. But it is scarcely legitimate to reason back from abnormal to normal without recognising the hiatus. Moreover it overlooks the possibility that mutation may be either effect or cause. It seems to be just as well established that in many cases mutations are adaptive. Indeed they would require to exhibit some measure of adaptation if they are to serve any biological function at all; a non-adaptive mutation may well be described as a'monstrosity', and if it appears in one or two individuals only, it has little chance of being'fixed' by natural selection as a valuable racial characteristic. On the other hand, however, 'particular mutations seemmto appear, not as an isolated phenomenon, but as a whole crop of similar mutations in many individuals at one period in the history of a species."[i]

We are not disposed to push too far an issue that is controversial, and which claims the attention of the expert; but we feel safe in claiming that biology has now been compelled to recognise that in the fact of mutation the emergence of the new is literally a 'vital issue'. This we suggest is the really important contribution of the mutation theory, and as we have suggested, the details might

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i. McDougall.W. Modern Materialm & Emergent Evolution p.152.

well be left to the experts.

This principle of the emergence of the new is of profound significance for the Christian doctrine of human worth. In its early stages, Darwinism seemed to have signed the death warrant of man's hopes, setting upon him the stamp and seal of a rigid natural inheritance from which there was no possibility of breaking. Today the watchword of biology is that 'becoming involves a creative advance into novelty'. The tendency towards newness of life is inherent in the very groundplan of things. J.A.Thomson has no hesitation in assigning this creative function to the germ-cell itself. "The germ-cell is a complex potential organism; it has a capacity which may be primary, of reorganising itself, of making experiments in self expression..the fertilised egg is not a bag of items, but a viable unity, a new creature, and the problem of the distinctly new is insoluble apart from the psychical."[i]

We suggest then that a mutation is fruitfully considered as the biological expression of the organism's inherent ability to reorientate. Out of the vital traffic with its environment certain increments of experience are accumulated. These may expend themselves in the usual way, through the ordinary channels of discharge. But the releasing

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i J. A. Thomson. What is Man. p.137.

stimulus may emerge in some critical situation, sensed by the organism through its appropriate mechanism as a survival problem calling for speedy solution. To meet this problem the organism mutates.

Mutation has been likened to a cow in a fenced field, free to jump about within the limits of its strictly defined inheritance quota. But we have discarded the theory of the germ-plasm against which such a criticism might legitimately be directed, preserving only the valuable principle that psychic integration involves the ability to re-orientate and appear as a new creation in the presence of crisis. We have seen cows leap to considerable advantage when occasion demanded. Nature in general likewise leaps to good advantage under the appropriate circumstances. We venture the hypothesis that some such leap ahead occurred in the line of evolutionary development which has culminated in man. The organism carries along on its normal plane of development until some such time as its accumulated experience demands fuller expression on a higher level. New needs are continually emerging in the dynamic life situation, these being both internally and externally conditioned. Stimulated both by inner urge and outer attraction, the leap is made. If it has been made to good advantage, the organism flourishes and perpetuates its

new departure. Every leap, of course, is attended by a certain risk. Without the element of hasard, necessary for real freedom, there could in our opinion have been no genuine evolution at all. All we are concerned to emphasise at this stage in our argument is that the ability to leap is a real factor in the developing life-process. As such we shall maintain that it has potent value for the Christian doctrine of human worth.

To recognise the power of mutation is not to be antagonistic to the Lamarckian emphasis upon the contribution of the environment to development. For us, the very reverse is the case; each is complementary to the other. So far indeed is mutation from ruling out environmental influence, or even the inheritance of acquired characters, that mutation itself "may be regarded as promoted or actually determined by the external conditions; in fact acquired."[1]

We have already noted Crew's statement that "the effect of a gene depends upon environmental conditions".

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i. Bower. Botany of the Living Plant. p.472.

9. Significant Present-Day Trends in Biology.

We have already considered the Wardian psychology with its insistence upon the subjective factor in evolutionary development. This is but one phase of a dual between vitalism and mechanism[i] that has lasted for three hundred years. Descartes undertook to explain the world and its contents in terms of mechanistic and mathematical laws, although outside his world he set God, and inside the human machine he set a soul. In 1748 De la Mettrie's "Man a Machine" added fuel to the fire. It was anonymously criticised in the same year by "Man more than a Machine". By the end of the 18th century vitalism was again in the ascendant.

The reaction of the 19th century, stimulated by the physiology of Claude Bernard, was reinforced by the researches into the composition of the cell which resulted in the physico-chemical theory of Schwann in 1839. Supported by the Darwinian hypothesis, this reaction found its extreme prophet in Haeckel. For the time being the faith of Lamarck and the other early vitalists was submerged; but it was literally too vital to perish.

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i. c.f Joseph Needham. 'Man a Machine' London 1928. details the story of the conflict.
Whitehead. A.N. Science & the Modern World. contains an excellent survey of the wide issues involved.
The Journal of Philosophy. Vol. XV gives a good bibliography

We shall consider now some present-day trends in biological theory which in our opinion are significant for the Christian doctrine of human worth. The general direction of these trends is towards a thoroughgoing rejection of the mechanistic schema. It is seen now to be hopelessly inadequate to explain the organism. For our purpose we select as significant the Vitalism typified by Driesch, the Psycho-Biology of Russell, and the Emergent Evolution of Lloyd Morgan.

Hans Driesch. The Philosophy of Organism & Wholeness

The earlier vitalists were content to assume that the activities of the organism were motivated by a vaguely conceived kind of 'vital force'. The vitalism of Driesch differs from such theories by its faith in the efficacy of a reality in living creatures which does not operate in purely physical terms. McDougall, a strong vitalist, dissociates himself from Driesch on the ground that this non-physical, non-mechanical factor in vital activity is part of the organism, not a something that acts upon it.

Driesch interprets his position in "The Science & Philosophy of the Organism" [1]. W. Roux, in 1888 recounted an experiment on frogs' eggs. Having

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1. The Gifford Lectures for 1907-8. 2 vols.

destroyed with a hot needle one of the first daughter-cells he discovered that the surviving cell developed into a half embryo. Three years later, Drieshh repeated the experiment, with sea urchin eggs,and was surprised to find that a miniature whole embryo, not a half,was formed out of the remaining cell. Further experiments led Driesch to the conclusion that'wholeness' was somehow or other involved in the nature of the developing organism; there was a something directing the development of the embryo. This something he called 'entelechy', adopting the expressive Aristotelian term. The entelechy is a 'factor in nature which works teleologically'. If we press Driesch too hard for an explanation of the entelechy we find that 'entelechies are not energies, not forces, not intensities,and not constants,but-entelechies"[1]

To all intents and purposes,accepting a mechanistic category as a method for analysis,Driesch recognised the ' extensive manifoldness of physico-chemical processes'. He insisted however,that in addition to these, there is within the organism an 'intensive manifoldness' which displays the 'psychoid faculties of knowing and willing"[2] This is the'entelechy'. Descartes offered his age a machine world with a great God outside it. Driesch seems to offer us the organism as a little machine with a miniature god inside it. It is this suspicion that the 'entelechy' is extrinsic to

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i. Vol.1. p.225 2. vol.2. pp 137ff.

the organism which weighs down Driesch's philosophy with all the implications of the older vitalism. To accept entelechy is to forego autonomy.

We are inclined to agree with MacBride that the'entelechy' hypothesis of Driesch is 'merely materialism plus an unintelligible regulating entity." For the'entelechy' which is seemingly endowed with all the psychic capacity of 'perceiving,liking,judging willing' is after all not psychic but merely 'psychoid'; that is to say, its'psychic' concepts are to be thought of only in a 'metaphorical' or 'pictorial' fashion.[i]

To an entity which is described as'psychoid' yet without being'psychic' we must repeat the words of Shakespeare,'tis something, nothing' .

Driesch's doctrine of the'entelechy', in the eyes of most modern biologists is an unsuccessful attempt to narrow the gulf between mechanism and vitalism. From the standpoint of scientific method nothing is gained by the insertion of an extrinsic agency into the series of mechanical processes. Yet the work of Driesch is not without its permanent and constructive contribution . His experimental demonstration of the unity of the organism-as opposed to its fragmentism-is a valuable confirmation of that functional

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i. vol.2. pp. 139 ff.

'wholeness' which religion has always more or less intuitively affirmed as a valuable element in personality. Later research by Boveri showed that normal development was dependent upon the integrity of the cell nucleus, and the nuclei of the eggs used by Driesch had been preserved intact . But this did not vitiate the valuable contribution of Driesch, namely that the action of the living organism as a whole is at the back of all development.[i]

The word "entelechy" is but another addition to a long list of attempts made by science to describe in analytical terms a process which religion intuitively affirms, namely that life manifests purpose as well as ~~xxxx~~ development.

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i Wilson The Cell in Development & Heredity. p.1115

Psychobiology.

To escape the defects of vitalism, many biologists today are attracted to a theory of interacting body and mind in which the initiative is taken by the psychic factor, and the organism is considered always from the standpoint of a functioning whole. Typical of this school in Britain is the psychobiology of E.S.Russell, who has expounded his views in several important works.[1]

Vitalism as such is rejected. The efficacy of mechanism in the physical realm is allowed, but it is denied that either the physical or the mechanical can explain the whole organism. To distinguish his theory from 'vitalism', Russell adopts the term 'hormic' from a treatise on Education by T.P.Nunn. The 'hormé ' is 'the fundamental striving that constitutes the inner reality of life'.

Psycho-biology claims affinity with both Ward and Haldane. From the former it takes as a starting point that 'psychology is the science of individual experiences, understanding by experience not merely nor primarily, cognition, but also and above all conative activity or behaviour"[2], and that 'facts, however ascertained, must to have a psychological import, be regarded as having a place in, or as being a constituent of someone's experience"[3]. With Haldane it agrees that

1. Form and Function. 1916.
   Psychobiology. Proc. Arist. Soc. 1922-3 pp.141-56 (p.76-85)
   Relations between Biology & Psych. Arist. Soc. supp.vol. 1923
   The Study of Living Things. London 1924. (p.163ff
   The Interpretation of Development & Heredity. Oxford.1930
2. Psychological Principles Cambridge 1918. p.27
3. do. p.28

"the living creature is really alive and full of molecular activity; it is the expression of the direction and velocities which this activity takes."[1] Hence "the organismal method... accepts the fact of unity..it regards the organism not as purely material, in the sense of being merely a structural configuration, nor as a body plus a soul or entelechy, but as a unity sui generis."[2] "The organism is essentially a continuing unity...its activities have a certain unifiedness and wholeness which are irreducible to processes of a lower order."[3]

A viewpoint similar to that of Russell has been reached by W.E.Ritter,[4] who subjects the 'elemental' or fragmented conception of the organism to a scathing criticism, finally arriving at a doctrine of the organism in which it is taken 'alive and whole'. This 'aliveness and wholeness' is the primary unit of interpretation of biological organisms. The various notions of 'living substance' are scouted with the conclusion that "all the living substance that has existed on this earth or anywhere else has existed through and in and because of individual living beings."[5]

From Ritter, Russell acknowledges taking over the term 'organismal" to designate his own theory.

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i. Haldane J.S. Organism & Environment. New Haven.1917. p.66
2. Russell.E.S. The Interpret. of Develop. & Heredity. p.190
3. do do. p.173
4. Ritter W.E. The Unity of the Organism.Boston.1919.2 vols.
5. do do vol.1. p.115.

Russell builds on the premise of a meaningful experience from the beginning of life up."The study of behaviour is inseparable from the problem of meaning..the function of perception is to make the organism aware of changes in environment and this implies a comparison of past and present"[i] "The line of attack consists in starting out from the facts of immediate experience-unifiedness of personality, undividedness of the preception-response relation-and arguing that some measure at least of such essentially psychological unity must pervade all the activities of living things."[2] Belief in the meaning aspect of primitive experience is confirmed by the experiments of Kepner and Edwards,who were able to show that the amoeba responded in different fashion to different stimuli, their conclusion being that the organism responds not to the stimulus as such but to the stimulus as meaning something."What we need(to) postulate for our new biology" is "some real ground for the objective purposiveness of living things"[3] "Wherever

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i.The Study of Living Things. p.65
2.The Interpretation of Development & Heredity.p.178
3. do. p.170 .

Russell refers to a striking example of'prospective reference' in cell cleavage,quoted by Wilson The Cell in Development & Heredity.p.1005, where the specific forms of cleavage cannot be understood without reference to the end formation.
'one can thus go over every detail of the cleavage,and knowing the fate of the cells,can explain all the irregularities and peculiarities displayed"
'The egg is not merely a cell dividing as best it may"
'It is 'a builder which lays one stone here, another there,each of which is placed with reference to future development'
c.f The Interp. of Dev. & Her. p.170 footnote.

perception enters,be it even in rudimentary form,a psycho-biological interpretation is called for"[1]. In other words,biology is always preceded by, and hyphenated with psychology.

Lloyd Morgan holds this to be merely'a speculative jump into mataphysics'. Russell quotes Drever's testimony that 'essentially the primary tissues of experience ought to be regarded as composed of meanings rather than as presentations or impressions"[2] It is interesting to note that Russell and Drever are both supported at this point by the findings of the 'gestalt' psychology. Koffka states that'some degree of articulation must be present in the original responses for without this there would be complete chaos,in which none of the other properties could exist...we find at the beginning in our most elementary reactions,even at the level of reflexes and instincts..unitary articulate meaningful wholes, to which we apply the name of 'gestalt',configuration','pattern'.Development starts not with chaos or a multitude of mental elements without meaning,but with structures,however primitive their character may be."[3] This same conception of 'superbiological levels in which meaning contents become significant" is the central idea of Spranger's'Types of Men.'[4]

It is through this meaningful perception that life becomes individualised and separated out from the environing flux"[5]

i. Int. of Dev. & Her. p.191 2. Instinct in Man. 1917.p.131.
3. Psychologies of 1925.p.141.
4. Tr. of 5th German ed.(Pigors) 1928. preface.
5. The study of Living Things. p.59.

J. S. Haldane.

A brief digression will serve to show the place of Haldane as a 'cross-over man' between the physical and the psycho-biological interpretations of organism.

Haldane definitely rejects the machine interpretation. "The activities of a living organism are not the outcome of its structure;really the structure is the expression of its normal activity."[1] The living organism regulates its own working and responds uniquely by adaptation of function to meet alterations in environment,provided this is not too sudden or too great. "To cope with the unusual..there is a strengthening or compensatory reaction accompanied by a corresponding structure change which may remain after the disturbance has disappeared; and through all the changes the organism retains its identity."

Concerning man,Haldane states,"although man is a person,and nor a mere organism,we cannot trace personality throughout all or nearly all of what we observe in man. To interpret these details as best we can,we have to fall back on the conception of life in the biological sense;just as in details of what we observe in connection with living organisms we have to fall back on physical and chemical interpretations."[2]

It is at this point we believe that the two schools of psycho-biology and emergent evolution bifurcate. Russell carries the psychological interpretation right back to the

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i. Organism & Environment. p.90 ff.
2. ibid. p.115

earliest manifestations of organic life. Morgan prefers to say that in the early stages it is impossible to distinguish the psychological from the biological aspect. He grants the existence of the psychic factor "ex hypothesi", otherwise, as he declares, it could not develop later; but since it manifests in the earliest stages of life no "prospective reference" he would rather not 'read in' the psychological story.

We have already noted Russell's quotation of"a striking case of prospective reference".

Emergent Evolution.

The concept of emergent evolution is interpreted in Lloyd Morgan's Gifford Lectures for 1922.[1] "Evolution" is the name given to "the comprehensive plan of sequence in all natural events'. But 'the orderly sequence, historically viewed, appears to present from time to time something genuinely new."[2] It is this insistence upon the genuinely new which is the vital note in Morgan's theory.

Morgan identifies his 'emergents' with Wundt's 'creative resultants',[3] and elaborates a pyramidical scheme of evolution broad-based upon the ground plan of an immanent divine activity, in the course of which the various new levels of life 'emerge'. It is to be noted that "from the strictly emergent point of view any notion of a so-called 'alien influx into nature' is barred." And "if we acknowledge divine activity-of which for my constructive philosophy-emergent evolution is the expression- it is conceived as omnipresent, and manifested in every one of the multitudinous entities within the pyramid. God, if in any, is in all, without distinction of entities."[4]

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i. Emergent Evolution. London 1923.
c.f also. Life, Mind & Spirit. 1926.
Biology, in Evol. in Light of Mod. Knowledge.
A Concept of the Organism, Emergent & Resultant, Arist. Soc. Proc. 1926-7. pp.144-76
Modern Churchman. Vol.xiv. No.5-6-7. Sept. 1924.
for brief criticism of various theories of emergence, see also McDougall. Modern Materialism & Emergent Evolution pp.232.ff

2. Emer. Evol. p.1. 3. p.4. 4. p.13.

Emergent evolution offers us a comprehensive schema intended to diagrammise the processes of development from primitive space-time to deity. It starts with a universe consisting of an undefined physical precursor of matter, a ground plan of what Alexander in "Space Time & Deity" was able to arrive at by a process of abstracting from reality all that had hitherto emerged-short of the sheer annihilation of experience. From this ground plan of 'pure motions' or 'point instants' in 'fluent relation', matter emerged. From then till now the development of the universe has manifested itself as a progressive series of significant and increasingly complex organisations of these primary relations of matter. In the course of development seven major levels of emergence are to be discerned. These emergent levels, from lower to higher, that is higher in the sense of involving a relatedness which could not appear on a lower level[i], are roughly to be recognised in what we distinguish as atoms, molecules, solids, life, mind, reason and spirit. These stages, though distinct, are strictly continuous within the whole process.

At each new level qualitative differences appear in the evolving process; the existing "world-stuffs" combine in hitherto unavailable "relatedness" and a new substance, which is not merely the aggregate of the former constituents of

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i. Emer. Evol. p.16.

evolution, but something wholly unforeseen before the actual occasion of its occurrence,now emerges. The uniqueness of these forward steps is the emergence of the qualitatively new, and this 'new', while directly the resultant of a re-organisation of already existent matter, is not a predictable resultant. In the re-organisation of matter there is a creative factor which is not discoverable in a mere aggregate. This creative factor in "relatedness" is the essence of emergence and "this advent of novelty"..is "loyally to be accepted..without invoking any extra-natural power-force-entelechy-God."[i]

To take an illustration. When atoms of oxygen and hydrogen 'relate' in a certain appropriate synthesis, a molecule of water emerges. It is assumed in emergent evolution that the qualities which constitute water 'qua' water are latent in the atoms which 'related' to make possible the emergence of water on the molecular level. But these qualities, though latent, can never become actual on the lower level of atoms of hydrogen and oxygen,in their pure or insignificantly related state. The emergent synthesis into molecular water takes place only when the appropriate atomic relatedness occurs. There is 'no alien influx into nature'.

Hence the implications of vitalism are avoided.

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i½ Emergent Evolution. p.2.

The critical step in the process is, of course, the emergence of life. "A critical review of physico-chemical processes as they occur in integral entities increasingly favours the concept of step-like advance with a sudden appearance of new characters. Hence..there arises at some stage a substantial difference which still justifies a valid distinction between the living and the lifeless. But it is a distinction that has arisen within one natural order of events."[i]

Life, then, is simply the peculiar properties and qualities which emerged on that particular level of development. Some favorable concourse of atome came to be, combining in a hitherto unattained degree of meaningful complexity, the already existing physico-chemical processes, and as a result life "emerged". On the emergent hypothesis no other explanation is possible, since prior to the appearance of life, nothing but inorganic complexities had emerged, and it is rigorously insisted that there is no "ab extra" contribution. These prior elements of evolution had latent within them the possibilities of life. They were, so to speak, the sleeping beauties of emergent evolution, awaiting the kiss of creative relatedness to wake them into life.

At this primitive level of 'life', Morgan insists that there is no evidence of conscious guidance, or 'prospective reference'. The amoeba, that is, may be alive, but to

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i. Evolut. in the Light of Modern Knowledge. p.114.

assign to it any cognitive reference is simply to commit the 'pathetic' fallacy of reading our own psychic properties into the situation. "Mind", as such, is a later emergence than 'life', and there are intervening steps, such as 'sentience' and 'cognition' . Eventually the level of 'spirit' is achieved, and in certain human beings the specific spiritual values emerge.

Contributions of these trends to the Christian value of man

It would seem then, that in these present day trends of biological interpretation we have suggestive material for a rehabilitation of the Christian doctrine of human worth. Yet it must also be recognised that between the schools of psychobiology and emergent evolution there are important points of difference which need to be considered.

Psycho-biology maintains that life has meaning from the very beginning. Emergent evolution insists that at the 'life' level there is no indication of 'mind'. Morgan concedes that of any organism 'two stories can always be told, the biological and the psychological", but asserts that at the mere 'life' level the psychological story must be kept out of print, since all signs of 'prospective reference' are absent. He grants that 'mind' must be there 'ex hypothesi', but merely in latent form for the actual to develop out of. As merely latent, however, it can have played no part in the evolutionary advance. 'Life' as such is without the guidance of 'mind.'

Russell sponsors the autonomy of the simplest organism to select or reject meaningful features from its environment, and sees in development an inherent ability to subordinate within the category of meaning these deep seated 'hormic' tendencies which constitute the drive of the life of the organism. Moreover, if the organism is minus organs to respond to significant features in its environment he holds that of its own initiative it may develop organs in response to its need, either from already existent means, or by the production of entirely new organs from undifferentiated living substance.[1]

In all vital events he sees the underlying and fundamental relationship of adaptation and regulation; he quotes the evidence of Starling that 'even in hormonic activity, "cells have the power to take up or reject specific substances according to their needs; and that the integration and regulation of metabolic activities is the work of the internal environment itself."[2] This regulative ability of the cells is also perceived by Wood Jones as 'cytoclesis'; "the call which can be exerted by one group of cells to another group, a call to them to change and to organise in such a way that a unified whole is developed."[3]

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1. The Study of Living Things. p.85

2. ibid. p.123.

3. The Matrix of the Mind. 1929. p.35.

In the doctrine of emergent evolution this spontaneity of the individual is smothered,we believe, by the supervention of divine control. It is not that Morgan offers us an 'atomic' individual. As a matter of fact,he expressly warns us that the living organism is not just one step higher than uranium."It is not a member of the atomic series-it is a natural entity with biological and not only abiological properties; it is a living thing."[1]

Our difficulty here is rather that in the emergent hypothesis,individuality seems submerged rather than emerged, All things live and move and have their being in God,but in a manner which tends to evaporate their autonomy. "Individual spirits",we read,"are the items of stuff that constitute the spiritual community,and the efficient presence of God is its Spiritual Substance in indivisible unity..in the chord of Whose richer personality our limited personalities are subordinate notes. For the essential feature of personality is substantial unity in its richest expression."[2]

Again, Morgan declares "for better or for worse I acknowledge God as the Nisus through Whose activity emergents emerge,and the whole course of evolution is directed."[3]

"Emergent evolution from bottom to top is ultimately dependent on an acknowledged directive activity."

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i. Evol. in the Light of Mod. Knowl. p.112
2. Modern Churchman vol.xiv. Sept. 1924. p.293
3. Emergent Evol. p.36.

In his anxiety to flee the mechanists and the vitalists, Morgan has fallen between the two of them. The emphasis upon the divine efficacy in evolutionary development has undercut the part played by the organism itself in selecting and responding to unique features in its environment. In avoiding the occasionalism of Deism Morgan has tumbled into the lap of a sort of biological Pantheism. It is the divine activity alone which gives the determinate plan of events, and "it is to be conceived as omnipresent and manifested in every one of its multitudinous entities."[1]

Lest we seem to have misrepresented Morgan, we offer one more quotation in which he explains his concept of emergent evolution. "The emphasis falls on the belief that spiritual agency is one and indivisible-operating always and everywhere-manifested in life and mind, yes, but also in the evolutionary foundations from which first life and then mind have emerged. It receives phenomenal expression in all that is susceptible of naturalistic interpretation. All that we call natural is due to one agency within, one coherent plan, and has spiritual significance in God."[2]

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1. Emer. Evol. p.13.
2. Modern Churchman. p.292.

But even if, in our opinion at any rate, Morgan overshadows creaturely spontaneity with the background of this all-pervasive divine directing, his insistence on the reality of the genuinely new, and his full approval of a principle of evolutionary 'discontinuity' is a valuable support for Christian theory. "The emergent step, though it may seem more or less saltatory, is best regarded as a qualitative change of direction, or critical turning point in the course of events."[i]

This is a plain confession in biological terms of a principle which Christianity has always held to be vital for its valuation of man, namely that, when confronted by crisis, in the light of significant accumulated experience, the individual may re-orientate himself, by making a 'qualitative change of direction.'

As we have already intimated, we intend to maintain that such a process has been one of the main facts in the development of human beings from the standpoint of organic evolution. It is possible for humanity to be organically and historically related to other evolutionary types, lower in the scale of 'relatedness', yet while retaining historic continuity to manifest at the same time a qualitative discontinuity through the emergence of the distinctively human characteristics. Emergent evolution has made it very clear that continuity of historic development is not in any way inconsistent with new starts all along the line of

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i. Emer. Evol. p.5.

development. "It is my belief that in the broad domain of nature, from bottom to top, natural leaps are many-so many that I have ventured on occasion to speak of the advance of nature as fundamentally jumpy."[i]

From the contributions of these present day trends in biological interpretation, Driesch's emphasis upon wholeness, Russell's argument for the spontaneity of the organism with respect to its selected environment, and Morgan's principle of creative emergence, it should be possible to harmonise the essential features in Lamarckianism amd Mutationism. More than any other, perhaps, it is Haldane who has paved the way in biology for the modern recognition of the part played by the environment, now generally admitted to be coequal with heredity. Organism and environment are neither antagonistic nor isolable; their complementariness evokes dynamic activities in each without wrecking the autonomy of either. Something is given, and something is at the same time received-or rejected. On the higher level, where spiritual personality interacts with a spiritual environment, the same relationship of giving and receiving is maintained. There is also the same opportunity for creative emergence. Christianity is inclined to believe that the richer side of the relationship is the divine gift that prompts the human response, resulting in the 'emergent step, a qualitative change of direction, or critical turning point in the course of events."

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i. Evol. in Light of Mod. Knowl. p. 108

SECTION TWO

i. The Upward Climb. The Transcendent Factor in the Advance from Protoplasm to Personality.

Evolution is provisionally understood as a continuous natural process of change in a definite direction, in which all the existing forms of life are considered to be related by descent to the simpler forms of long ago. As such it has proved a generalisation extremely fruitful for the understanding of nature and the universe. Generally speaking there has always been a tacit recognition among naturalists of what we might call the broadly directive factor in evolution. In other words, the evolutionary hypothesis is not only a scientific generalisation; it is at the same time a profound value judgment upon life. Our intention is now to examine this valuable element in evolution. We believe it can be shown to have importance for the Christian doctrine of human worth.

The procession of life upon the earth, insofar as it can be deduced from a comparison of the various groups of existing animals is intelligibly interpreted as an advancing series from the simplest to the most complex, or as we would prefer to say, from the lowest to the highest. In the lowest form of organism-and no matter how far we descend in the scale of living things, the explanatory concept is always organism-life manifests itself in the presence of, and through the medium of minute 'specks of jelly-like substance' in which the main function of nourishment is multiplication. At the opposite end

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of the series stands man, mastering his surroundings, through his greatly developed brain. "Beginning by living to eat, the series soon advances towards eating to live. Then comes the reign of flesh, with just enough nerve to make the muscles effective for moving and grasping. Finally the brain end of the nerve begins to preponderate, so that the animal no longer responds listlessly to its surroundings but improves first in instinct, then in reason, and eventually attains supreme intellectual control."[i]

The record of the rocks is no less impressive. After men had come to realise that fossils were not to be regarded as tricks played by the Almighty to test their orthodoxy, it became very obvious to the discerning eye, that spread over tremendous intervals of geologic time there had been an orderly arrival of the various great groups of life, their order of appearance strikingly correlated with the increase of brain development. In other words the trend of evolution has been in the direction of progressive development of the instrument of self-determination.

To read this story of the upward climb of life is to be impressed by one vital fact, the extraordinary power of selection and adaptation displayed by the developing organism. Living things have wrestled with their surroundings as Jacob wrestled with the stranger at Peniel, refusing to let

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i. Creation by Evolution. p.124.

them go until they had won a blessing from the struggle. For our immediate purpose, the noteworthy fact of evolution is that nature has produced organisms capable of reacting to their environment with a freedom and variety of response which transcends the strictly biological categories of explanation. The end-product of the evolutionary process to date is man-at the very least a psycho-biological organism, which while rooted and grounded in the process that has nourished him, is nevertheless capable of looking back over his history and evaluating his own development; at the highest, a spiritual personality who has reason to believe that the environment which sustains him is energised by some kind of life that answers to his own spiritual outreach. While he is in the world, he is also not of it.

It is fully admitted that the history of man is continuous with pre-existing forms of life which go right back to the beginnings of organic existence, possibly even beyond that. On the other hand, it is just as strongly maintained that this continuity, while real, is at the same time punctuated all along the series by the outcropping of new qualitative differences. These outcroppings, without disrupting the continuity of the sequence of evolution, nevertheless compel the recognition of a psychic factor at work within the series whose final resultant is spiritual personality.

Let it be understood at once that these qualitative differences are not to be regarded as 'different degrees of spiritual influx' poured into the process by some extrinsic 'deux ex machina'. This would implicate us in a dualism which we do not care to sponsor, since it would undermine the objective validity of the values which we hope to establish. Man is undoubtedly organic to the processes of nature, and his discovered values may not legitimately be divorced from the universe that has nursed him. The valuable element is in life itself. Each stage of the process with all that it contains must find its explanation within the universe, and not outside it.

Our assumption is that this universe, in spite of its many mysteries, furnishes a beneficent milieu within which each organism enters into an interlocking relationship with its specialised environment. Out of this relationship there emerge those qualitative distinct ions of life whihc give meaning to evolution.

We submit, then, that the procession of life has advanced not so much in a straight line of gradual uniform ascent, as by a series of incremental lifts, or experiential crises, which have usually been "greater in their implication than in the actual moment"[i] of their occurrence. Nature has risen to the heights of spiritual personality by a certain

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i. J.Y.Simpson. The Spiritual Interpretation of Nature. p.110.

amount of indirection, involving processes whose end results could not always be predicted. To make evolution intelligible it must be viewed in the light of the whole, as a creative functioning of life. The developing organism must be credited with the ability to meet and surmount new conditions of existence, inventing for itself, in cooperation with its environment, genuinely new responses, when these are not already part of its inherited stock-in-trade.

In other words, the biological study of man is incomplete with the inclusion of the psychic factor. The basic category of interpretation is organismal creativity in cooperation with a dynamic environment. Life starts out as a biological experiment, but it ends as a spiritual experience.

The arguments for evolution, deduced from comparative anatomy and geology, are strikingly sustained by the facts of embryology. Genealogical trees were growing long before Darwin proved that fancy was fact. Johann Friedrich Meckel(1781-1863) laid the foundation of the belief that the higher animals in the course of their development show a regular unfolding of the 'échelle des êtres'. Antonio Serres (1786-1868) gave a similar interpretation of the phases of embryonic development. This Meckel-Serres law of recapitulation, despite the cogent criticism of observers like Von Baer,[i]

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i. "it is self evident that while each step in development is only rendered possible by the preceding stage, the whole course of development is nevertheless ruled and guided by the essential nature of the future organism-and any one state is not the sole and absolute conditioning factor of the future. It is not the 'matter' in its mere arrangement but the essential nature of the procreating organism that rules the development of the offspring."
quoted. Russell. Interp. of Devel. & Hered. p.35.

was finally summed up epigrammatically by Haeckel in the dictum that 'ontogeny is the short and rapid form of phylogeny'. Popularly this was taken to mean literally that in the course of development every animal climbs its own ancestral tree. The child was father to the man, while the 'lord of creation' was blood brother to the brute. Human 'stock' literally reached a new low level!

Today the fact of recapitulation, once held to be a powerful support for the mechanistic interpretation of evolution, has been compelled to pay tribute instead of exacting it. There is no denying the fact that man has evolved from a line of ancestry traceable back to the lowest forms of life. The main trends of his pedigree are fairly well established. But the human embryo is confessedly from first to last human and unique. "Every part of the human body passes through an extensive series of developmental changes", but "not one of these copies a form seen in any living animal."[1] The human embryo is characterised by new features which guarantee its uniqueness, and these features influence the whole course of future development.[2]

The new branch has, so to speak, changed the character of the whole evolutionary tree.

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1. Keith. Nature cxii. p.267
2. Keith. Human Embryology & Morphology. p.35.

We have already referred to the work of Roux and Harrison and Speman. These workers have shown conclusively that two distinct stages are manifested in embryonic development. The first includes the directly inherited deposit,and it is passed through in the absence of function. But during the second stage of development,the sheer inheritance deposit comes under the controlling influence of the organism's 'function',and the 'differentiation of the organs laid down in the first stage' is directly controlled and re-orientated by the exercise of the specific functions of the organism itself.

In other words,the phases distinguished in recapitulation are simply milestones on the highway of life,laid down at the biological cross roads, witnesses to strategic points in the organism's triumphant march towards the freedom of the spirit.

It would seem that no strictly defined boundary can be set up between biology and psychology. Life,whatever else it proves to be, is at the least psycho-biological. How far back into the biological realm may the psychological factor be carried? Here we meet with disagreement among the experimenters. Morgan, we have seen, prefers to keep the psychological out of the biological in the primitive stages of life. He weakens his case considerably,by admitting that the potentiality of mind is latent,to serve as a basis for

future emergence;but he denies that "prospective reference" can have played any part in the earliest stages of evolution.

Our own position is that the latent possibilities of mind must be present in primitive forms, in a very real sense,not merely 'ex hypothesi'. Otherwise we are forced to concede that in the later stages the new element is surreptitiously smuggled into the series by a 'tour-de-force' which violates the autonomy of the developing organism.

This,for us,is one of the weak spots in emergent evolution. The concept of emergence is apt to become a synonym for'miracle' if the separation between biology and psychology is made absolute. On the evidence submitted by Jennings,Russell, McDougall,et al, we are not guilty of the pathetic fallacy when we maintain that in the lowest forms of life,even in unicellular protozoa,there is some rudimentary or primitive analogue of what at later stages we easily identify as an active psychic integration.

This primitive analogue cannot of course be equated with consciousness;the'memory' of the amoeba is scarcely human memory. Our point is that from protoplasm to personality, the living organism is unintelligible apart from the psychic unity which characterises it as as integrated life-whole.

The form cannot be understood apart from the function. The function, in its turn, is meaningless when considered apart from the presence of the psychic integration which expresses itself in autonomy. and absorbs vitalising elements from the environment. If this be granted,and we believe the

facts demand it, then the sublime motif of evolution is a well attested record of progress in self-determination towards that liberated self-consciousness whose climax is spiritual personality.

Biological opinion is generally agreed today that animal life originated, and passed the early stages of its evolutionary history, in the warm shallow waters skirting the shore, where survival conditions were at their best, giving ready access to such essentials as food, oxygen, water. Thus the brilliant guess of Anaximander-made twenty five centuries ago-is strikingly vindicated.

It is assumed that the pressure of over-population in these warm shallows would compel such of these primitive marine forms as could adapt themselves to altering conditions, to migrate either seawards, or landwards. Hence in due course, from these ancient tidal waters, 'nurseries of new types', there emerged from some generalised form the distinct types of fishes and land animals. "Some primitive creature, with external gills, developing in these warm marginal zones, gave rise to the two contrasted types that spread in the one case seawards, and in the other case landwards."

These diverging migrations meant the necessary development of significant new adaptations. Not the least impressive of these, in the case of the landward moving animals, was the achievment of a new method of breathing. We are forced

to infer that some primitive but venturesome member of these early types,"driven possibly by a need for more food,or seeking further supplies of oxygen",managed to wriggle out of the muddy waters,in this act becoming a pioneer in the new art of land living.

That this is not entirely fanciful is confirmed by a study of the still existing mud-fishes inhabiting rivers which dry up in the summer. These creatures,burying themselves in the mud,are able to survive periods of drought by a development of the swimming bladder,which during the critical period discharges the function of a lung. The ancestral type of the existing mud-fishes was prevalent in the Devonian and Silurian ages.

The achievement of'dual-control' is also preserved in the 'blenny' or 'shanny'. Coming up with the tide,this little fish is often stranded-literally a fish out of water-but so long as its gills are moist the blenny is safe,even for twenty four hours at a time.

The landward 'march' meant new adaptations of the limbs of the ancestral animals. "The fore-paddles began to be bent at the future wrists and elbows; the hind paddles bent in the opposite direction, at the future knees and ankles. The fan-shaped bony rods of the paddles broke into segments,to give rise to the finger and toe bones. Thus man,in common with other vertebrates, has inherited the basic pattern of his five fingered hands and five toed feet from the earliest land living vertebrates."[i] We shall see later on that this

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i. Creation by Evolution. p.279-80

seemingly simple fact is worth a very great deal to man.

This upward climb, starting out so bravely from the warm waters of Palaeozoic time,continued steadily throughout the now familiar series of fish,frog,lizard, bird and mammal. Significant above everything elsein the ascent is the progressive increase in the comparative size of the forebrain. Correlated with geological succession we find the impressive fact of cumulative enlargement of the organ which permits highest expression of the fuller and the more abundant life.

Biologists hitherto have hesitated to recognise the 'pretentious claims of orthogenesis.' To confess purposive trends in evolution was be branded as non-scientific. This hesitancy is not so marked today,for facts have their own way of compelling assent.

An excellent case in point is the development of the modern specialised horse from its diminutive ancestral representative,"Eohippus". Originally one foot high, four-toed in front and three-toed behind, the graded series of developmental changes leading to the present type of horse have been beautifully demonstrated in hundreds of fossil collections. It seems impossible to doubt any longer that this development has been characterised throughout by a definite trend towards richer relationship with the environment. Pervading all the various changes of form and function there has been the adaptive power of the living

creature,namely the psychic unity.

We are reminded too that Nature shows evidence of definite trends towards health and beauty. It would seem that"in any one line of evolutionary change,especially of those regions of the body which do not show specialisation, development proceeds apace,as if from the first to last devoted to the production of a definite final structure."[i] Equally significant too, as we shall see later on, is the warning that an animal group once committed to a specialisation cannot revert again to a primitive condition in that particular feature.

The most impressive record of orthogenetic evolution is the vertebrate series that culminates in man.The sustained trend has been towards autonomy of the organism, seen in the increasing efficiency of its inner responses,and its freedom and variety of action in the presence of emergency. Moreover this progressive advance in efficiency of self-determination bears unique witness to the fact that the race is not always to the swift,nor the spoil to the strong. Celsus,in early Christian times,taunted Origen with the jibe that if the frogs could have a god he would take the form of one of themselves. But if twentieth century man could reverse the flow of time and have the privilege of visualising the amazing flora and fauna of Paleozoic and Mesozoic days,and were asked to

i. c.f. In the group of the titanotheres,certain rudimentary structures were preserved long before they could possibly have had any survival value. After many generations of progressive development these structures were sufficiently perfected to be of decisive aid in the struggle for existence.

single out the future controller of nature he would never have selected the puny ancestral mammalian proto-type of man. It would seem incredible that the future of evolution lay with the 'little marsupial mammal diligently striving to avoid becoming a saurian meal."[i] Yet such was to prove the case.

The destiny of mankind was in the balance in these far off days. The primitive proto-mammal stood at the cross-roads; around him his saurian competitors for survival were wasting their substance in the riotous life of the flesh, investing the life possibilities in quantity instead of quality; sacrificing plasticity of mental development for sluggishness of bodily enlargement. Specialising in armour-plated externals, they signed their own death warrant, trading their birthright for brawn and muscle.

"Refusing the way of over-specialisation in bodily externals, as it had avoided the burden of a double life in amphibian existence; preferring the adventures of the new land life with its novelty and opportunity", surrendering weight for wit, the proto-mammal preserved its primitive plasticity, thereby ensuring its autonony, growing in wisdom if not in stature.

The upward climb was accompanied by many genuine advances. The winning of warm-bloodedness was a significant

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i. J.Y.Simpson. Spiritual Interpretation of Nature. p.136-7

gain,making for increased efficiency of life,and a helpful independence of the outer temperature. It afforded a very valuable measure of preparedness to cope with unexpected environmental crises.

There were other critical steps in the ascent which led more and more in the direction of preparation for the future 'mind' life. The retention of the egg,for instance, ensured the advance into true maternity. The prolongation of the infancy period made for longer and safeguarded brain educability. These were all clear gain to the manward headed stock in the race towards final victory.

Every advance in the development that was leading towards man was made at a critical stage in the experience of the growing creature,and at some cost. The progressive individual must always choose between present possession and future possibility. We purchase our freedom at a great price. Life is a faith venture however we look at it.

The sluggish types,whose motto was 'safety first', either perished in the struggle or fell behind in the race. The future is always with those who lay aside every weight, and run with patience the race that is set before them, pressing forward towards the mark of their high calling. The drama of the upward climb towards man is at once a revelation of life's possibilities,and a witness to the might of the invisible power whose presence makes for righteousness.

Significance of Form & Function

As the result of his evolutionary researches, Darwin concluded that "we must acknowledge that man, with all

his noble qualities..sympathy..benevolence..godlike intellect.. still bears in his bodily frame the indelible stamp of his lowly origin". Huxley,no less profoundly disturbed than his great master,was driven to declare,"I know of no study which is so saddening as that of the evolution of humanity as it is set forth in the annals of history..Man is a brute, only more intelligent than the other brutes" From these premises,it was but another step in the argument to assert that civilisation was such that he "would gladly welcome a kindly comet to sweep the whole affair away."[i]

The honest man will refuse to hold fast to his faith in human values merely for the pragmatic efficacy of inspiring hope in those who accept it. He would rather,like Huxley himself, "sit down before facts as a little child". On the other hand, facts are notorious bullies,and the man who values wisdom as well as intellectual honesty will refuse to be browbeaten by 'mere facts'. It seems difficult to dodge the truth that the belief that man is little more than a sophisticated brute,has taken its toll of human dignity. It is a sobering fact to be reckoned with,that the hasty undervaluation of human worth, arising out of the earlier evolutionary conclusions,is one of the major factors in the modern scepticism of the dignity of human life. We are not concerned to elaborate this point, believing it to be self evident to discerning eyes.

The extreme effect of such scepticism towards life,

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i. Bury. The Idea of Progress. p.344-5.

upon man's imagination is illustrated in a penetrating analysis of the modern mood by one of the keenest of critics. The ~~valedictory~~ Verdict of this writer, after a survey of life, is summed up as follows,"Leaving the future to those who have faith in it, we may survey our world..and permit ourselves to exclaim..

Hail, horror,hail infernal world!
And thou profoundest hell, receive thy new possessor.

Ours is a lost cause, and there is no place for us in the natural universe."[i]

Nevertheless, he still prefers to die as a man than to live as an animal.

Structural Resemblance & Kinship. Convergent Evolution

In our opinion, the argument from analogy to identity has been seriously stretched in the matter of the interpretation of man's evolutionary history. More particularly, this is the logical outcome of a trend in biological method which is steadily giving way before the recognition of the functional nature of the organism. From Aristotle to Linnaeus(1707-78), the classification of organic life was made on the basis of the principle that similarity of structure involved a close degree of relationship.With the advent of Darwinism the stage was set for an interpretation of evolution along the lines of the Linnaean classification. The results have been disastrous for the conception of human worth. The argument from structural resemblance to kinship, to the exclusion of the more subtle distinctions involved in function

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i. The Modern Temper. J.W.Krutch. London 1930 p.248

still makes its appeal to some biologists, but it has serious limitations. From the point of view of structure, an animal may be a complex of its basic inheritance and its adaptation of habitus, but 'one fundamental structural difference begot of heritage outweighs many structural resemblances begot of habitus."[i]

To argue dogmatically from structural resemblance to kinship without taking cognisance of the force of convergent adaptation and its power to produce superficial likenesses in unrelated forms is seriously to strain the argument. Keith states that his conception of the rapidity and manner of man's evolution has been altered in recent years by the law of 'uniform or collateral evolution' which has a "wider significance than I had formerly believed."[2]

The law is clearly enunciated by Wood Jones."Identical correlated adaptations might be manifested in different animals which,having no intimate relation with each other,are subjected to the same range of environmental conditions..these might chance to be trivial,or they might be extensive; they might possibly be conceived as being so complete as to produce two specialised animals which attain a considerable degree of superficia-l identity,and which yet arose from two utterly different stocks."[3]

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i. Wood Jones. Ancestry of Man. 1923. p.10-11.
2. Keith Sir A. The Antiquity of Man. 1925. vol.1.pref. to 2nd ed. p.xv
3. Wood Jones. Man's Place among the Mammals. p.31.
Willey. A.'Convergence in Evolution' illustrates the wide application of this law.

The Psychic Synthesis Preparatory for Emergence of Man.

There is no unanimity of opinion as to the identity of the proto-mammal whose line of development eventuated in man. Elliot Smith traces the human stock back through the lemurs. Wood Jones favours the idea of a stock represented by'tarsius! The distinction as we shall see later on involves a great deal more than a difference. It is agreed that at some stage of evolutionary history an extremely primitive mammal took to tree life-a small land grubbing animal-facile of limb- and underwent an evolutionary phase among the branches. What caused this critical step to be taken we cannot say, but it was a stage in the upward climb fraught with significance for'man in the making'

As a land grubber,this protomammal had nosed its way through life, the sense of smell being its chief manner of experiencing and the snout being the organ definitely specialised for discrimination. "The most primitive cerebral cortex is an olfactory cortex."

One direct result of the climb into the trees was the setting free of the forelimbs to become organs of outreach; they developed the power to grasp while the hind limbs became organs of support. Henceforth the animal with freed forelimb could develop the habit of carrying food to the mouth with the 'hand' instead of having to take it directly with the mouth. This in turn involved another 'departure' , the disappearance of the snout region, the emergence of the 'hand' making more and more unnecessary the use of protruding lips and teeth for grasping food.

This recession of the snout area was correlated with one of the major triumphs of evolution, the attainment of stereoptican vision. The ~~consequent~~ shifting of the eyes from the side to the front of the face permitted bifocal attention to be brought to bear upon objects. This power of concentrated visual attention was greatly enhanced by the "enormously increased power of turning the head from side to side,"[i] which went with the shortening of the snout region. Hence sound and sight could now be correlated in the same movement, making for a great increase of efficiency.

Note now the striking synthesis which takes place.The snout successfully out of the way,and the hand liberated, the latter takes over the function of touching and testing in addition to grasping-functions which formerly belonged to the olfactory organ-and performs the work more efficiently. For the freed hand becomes a sensitive instrument. In conjunction with the enhanced power of vision,objects which were formerly tested by smell could be taken up,examined, and the impressions gained from other sense organs criticised.

The result of this is seen in the growth of the organ of perception. As the animal grew in wisdom,it felt the need of some place to store up the new impressions it was gathering. Hence the "neopallium", the "birthright of the proto-mammal' started to grow. The olfactory parts of the brain began to lose their importance,almost to the point of atrophy in the primates. Their usefulness was limited by the life in the trees. "In man the sense of smell is one of the minor factors in his whole physiological economy."[i]

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i. Wood Jones. Arboreal Man. p.155.

In the creature which took to the trees, the primitive form of hind-limb-longer than-forelimb prevailed,"making it erect and bipedal in poise and progression". This condition is still retained in primitive "Tarsius", as it is also in man. The anthropoids have specialised in the direction of forelimb-longer-than-hind-limb.

On this fact,Wood Jones bases an argument that man never passed through an anthropoid stage of evolution at all. If he did,"he must have converted the primitive mammalian "leg-longer-than-arm condition into an anthropoid arm-longer-than-leg-condition" and subsequently reverted to the human leg-longer-than arm, of today.[i] As a result, Wood Jones concludes that man's progenitor branched off from the primate phylum before the pithecoid specialisations were stereotyped among its members.

For our purpose,the important fact of the arboreal stage in evolutionary history,is that the proto-human stock took full advantage of the temporary tree life without developing the specialisations into which the anthropoids were snared. ~~They~~ It never became so overdependent upon brachiating life among the branches as to lose the possibility of "true orthograde bipedal progress" when the descent from the trees was made. If proto-man climbed up,he walked down, and he has stayed on his feet ever since.

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i. Man's Place among the Mammals. p.312.

Retention of Primitive Unspecialised Features in Man.

"An unspecialised society can survive through important changes in its environment..it can take on different functions in respect to a changing environment..by reason of flexibility of structural pattern it can adapt that special pattern to its circumstances of the moment..thus the problem of nature is the production of societies which are 'structured' with a high complexity,and..at the same time 'unspecialised'..In this way intensity is mated with survival." [1]

This statement applies with striking appropriateness to the case of man himself. For one of the chief claims man can make to uniqueness-biologically speaking-is the fact that throughout his evolutionary career he has followed the law of successful minimum specialisation. In a very real sense, man is the summation of all that has gone before him, a living embodiment of the eternal in the temporal, yet in spite of his amazing incorporation of what has prededed him in time, man has curiously remained unique in his minimum of specialisation. In this very fact lies his great capacity and potentiality for progress in the direction of the more abundant life.

Many of the great animal groups have owed their extinction to the folly of overspecialisation. Fossil records show,for instance,that annihilation has often been preceded by excessive growth. Irrelevant complexity indicates faulty integration of the life of the organism. Man in this respect bears about in his body interesting evidence of his uniqueness. When Darwin said that man "still bears in his bodily frame the

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i. Whitehead. Process & Reality. p.140

the indelible stamp of his lowly origin' he might have used the statement to exalt man rather than to debase him.

Prof. Elliot Smith has shown that structurally man retains many primitive unspecialised forms, thereby securing for himself and his progeny the original plasticity of life, with the possibility of future development that goes with it. The hand of man is a good case in point. While other types took to habits that made them specialise in hoofs and claws and flippers, man kept his hand-and in doing so he literally kept his head. "The human hand is a strangely, almost shockingly primitive survival...cultivated as a grasping organ..it retained and perfected the opposable thumb..man has retained in his hand a'universal organ'"[1]. It was this retention of primitive plasticity of function correlated with the advance into large brainedness so lacking in the other mammals that singled its owner out as a'marked'man.

Again 'the arrangement of the bones and muscles in the human arm is the retention of a condition so primitive that it is matched...by types situated in the vertebrate stock right at the point of mammalian divergence."[2]

Neither will the shoe pinch when we try it on the human foot. "Man has a true foot", says Boule[3] "an organ for support". The foot is the organ whose structure 'definitely severs him from all other existing primates"[4] There is full

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1. Wood Jones. Arboreal Man. p.73
2. ibid p.46.
3. Boule M. Fossil Man. p.77
4. do. p.73.

opposability in the feet of apes. "It may be said quite dogmatically that opposability of the big toe never occurs in any measure in any (human) race whatever."[1] The foot of the anthropoid is an organ of prehension; the foot of man is an organ of support. The combination of two hands and two feet has proved a tower of strength to the manward-headed stock, so that Osborne can say,"the better we understand the human anatomy and mechanism,both of the hand and foot,and the more we learn of the ancestors of man, the less close appears our relationship to the great anthropoids."[2]

The same story is continued in the human teeth. Man's teeth are survivals of the original condition which was the starting point of all the various types of mammalian teeth."He is extraordinarily primitive in regard to his teeth."[3]

To sum the matter up, when we consider man structurally, we are considering an organism whose boast it may well be that he is as nearly "animal-in-general" as it is possible to be. With primitive simplicity goes enhanced plasticity, and latent possibility. Truly it is not yet manifest what we shall be.

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1. Wood Jones. Man's Place among the Mammals. p.314
2. Osborne H.F. Man Rises to Parnassus. p.181.
3. Klaatsch. The Evolution & Progress of Mankind. p.54.

The Preparation of the"Mind-Life".

Let us consider now the distinctive feature of the whole evolutionary process, the amazing development of the big brain, which constitutes the primary reason for the emergence and the ascent of man. Careful examination of the human head has shown a development of the skull bones through ten well marked structural stages,"from the fish upwards." But "each new level is punctuated by the incorporation of some characteristic gain."[1]

Starting with a preponderance of olfactory brain representa/tion the uprising proto-mammalian stock took every possible opportunity of developing the 'neopallium',conserving the gains of experience for the future good of the race, relying less and less upon the earth-bound sense of smell, and increasingly more upon the organ whose presence represents the physiological concomitant of a unified consciousness.

It seems that "nature tried innumerable experiments with the new type of brain."[2] Some types used their freedom to specialise, in tree life, or in acquatic life. Religiously stated, the wage of sin is death. Biologically, the result of specialisation is stereotyping. Man belongs to an order of life which was steadily specialising in vitality, in the direction of increased brain power, and in gregariousness.

The upward climb was aided by the synthesis of all these factors,working in cooperation with the increasing brain. Sight had replaced smell and stimulated venturesome

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1. Quarterly Rev. of Biology. Vol.2. No.2. Gregory W.K.
2. Elliot Smith. Essays on the Evolution of Man. 1924.ed.p.28

curiousity; the emancipated forelimb, gaining skill and precision through a sensitivity born of richer experience furthered a more appreciative understanding of the outside world. This wider understanding had its effect in fostering control of appetites and instincts, laying the foundation for an infinite distinction between the truly human and the truly animal. Add to this the vital fact that the developing brain of the protomammal was able to function through organs that had preserved their primitive plasticity and we see one of the main reasons why out of its weakness the stock of man was made strong.

Elliot Smith points out that 'no structure found in the brain of the ape is lacking in the human brain; and on the other hand the human brain reveals no formation of any sort that is not present in the brain of the gorilla or the chimpanzee"[1] Keith also reminds us that 'the difference it is true is only quantitave, but the importance of the difference cannot be exaggerated"[2]

We would suggest that any interpretation of life must take wholeness as its fundamental explanatory concept. It is the whole man we are concerned with in the last analysis. Man was bound to prove his worth in the upward struggle because he was the only creature fitted with the

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i. Essays.
2. Concerning Man's Origin. 1928.p.26.

requisite composition of brain and plasticity to take full advantages of all the cooperation afforded by the possibilities offered in hand and eye.

"The human brain is remarkable in that its growth is so long continued. Moreover its prolonged growth is especially conspicuous in those regions in which the eseentially human characteristics are represented."[i] This condition is directly correlated with the prolongation of the human infancy period, which permits a period of development sheltered from premature responsibilities. The anthropoid brain comes to a standstill at a relatively early stage of development, the brain of the monkey earlier still. It takes the human brain two years to reach the stage of development which the anthropoid has had to attain at birth. It takes man twenty years to approach physical maturity; mental maturity comes at a much later age. This extension of safe infancy has given the human brain opportunity to develop in a way denied to other animals. Creatures which have to enter upon the life struggle quickly, require to be well endowed at birth; but the high speed endowment is purchased at the price of stereotyped capacity and too rapid maturity.

Here then is a clue to the apparently intelligent actions of trained animals which so often puzzle people. Journalistic literature has hypnotised the popular

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i. Man's Place among the Mammals. p.340

imagination with instances of animal behaviour based implicitly on the assumption that the anthropoids are simply a sort of younger brother stage to the human. Animal experiments have seemed to fortify this conclusion. But it is obvious now that any glimmerings of apish intelligence are merely the last flicker of a lost possibility, not a nascent faculty which will presently become human. The use of sticks to fish for bananas placed beyond reach is scarcely a fair premise to argue for 'intelligence' as we understand it. Rather than run the risk,however,of appearing to be biassed, we will let the expert speak for himself."If in testing the reactions, mental processes and social behaviour of the anthropoids,the observer is xxxxx fully aware that he is making test of phylogenetically senile animals,specialised altogether away from human characteristics,all is well with his conclusions;but they can never be of a very far reaching nature; but if he is under the impression that he is investigating an incipient human stage,through which man has passed,and which may therefore be expected to throw some light upon the development of human characteristics,he is likely to be led,and to lead, astray. The findings derived from a specialised and senile end-product of a phylogenetic line must not be accepted as being equivalent to those derived from a primitive and plastic early member of a related stock."[i]

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i. Wood Jones. Man's Place Among the Mammals. p.354-5.

The verdict of Tilney confirms this judgment."It does not seem sufficient to linger among the modern apes in search for our ancestors. These animals belong to families totally divergent from man."[1] He concludes that attention should be directed not to these simians,but rather to the generalised mammalian stock which preceded both apes and man.

Wood Jones; Argument for Non-Anthropoid Evolution of Man

This leads us to consider an interesting trend in evolutionary interpretation. It has not been received without criticism,[2] but evolutionary categories are in a fluent condition at present, making dogmatism impossible.

In 1919, Prof. Wood Jones issued what were hailed as "remarkable speculations", in a brochure called "The Problem of Man's Ancestry". He excluded all the apes and monkeys from man's ancestry,and derived the human family directly from "a tarsius-like animal". The theory was strongly criticised at the time. In 1929,however,Wood Jones returned to the charge with a new publication[3] in which he advanced a very impressive elaboration of his first thesis,with abundant anatomical analysis. He takes the step of uniting the lemurs with the tree shrews,and dismisses them from the company of the monkeys and apes,in the face of Elliot Smith's judgment that "the facts that establish the right of the lemurs to be regarded as primates are no less definite than those that

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i. F.E.Tilney. The Brain from Ape to Man. 1928.p.1043
2. Nature. vol. 125. No.3140. Jan.4.1930
3. Man's Place among the Mammals. 1929.

make the whale a mammal." Wood Jones argues that such monkey like developments as the lemurs have attained are due to the fact of convergence,which Elliot Smith in 1920 criticised as 'a fashionable and overworked doctrine', but which nevertheless Sir Arthur Keith in 1925 was inclined to treat with increasing respect.

Wood Jones maintains that'the protohuman stock separated from the stem of the primates before the definite pithecoid specialisations had become stereotyped.. from a tarsioid form that had not developed the specialisations seen in the living tarsiers..that there had been a development from this primitive tarsioid stage in the general direction of a primitive gibbon that had not achieved any definite pithecoid specialisations..possibly at the propliopithecus stage..small,active,agile,..legs longer than arms..already erect..moving in bipedal fashion among the branches..anatomically prepared for terrestrial bipedal life.. possessed of crania already enlarged..jaws small,with no specialised enlargement or sexual differentiation of the teeth..and moderately enlarged eyes."[i]

In other words,according to Wood Jones, man never passed through an anthropoid stage of evolution at all. His remote ancestors,newly emerged from some tarsioid stock,constitute a'progressive'as opposed to a'conservative '

i. Man's Place Among the Mammals. p.356-9

group which broke clean away from the rest of the primate stem, probably during some period of "phylogenetic rioting", such as is displayed in the Siwalik remains, and then developed along the lines of its own manward headed trend. The non-human proto-types were sidetracked into their respective pithecoid specialisations.

Hence no existing anthropoid can have been the ancestral type of man. Pithecoid specialisation has advanced too far. This however is generally admitted. On the other hand, man himself could not have arisen from a common anthropoid stem. If he did, then it would seem that in his particular case we have to assume a major infringement of the law of irreversibility of structure not known elsewhere. For a group, once committed to a specialisation cannot revert again to a primitive condition in that particular feature. Man, starting out with the original primitive leg-longer-than-arm pattern, would require to be assumed as having adopted the anthropoid arm-longer-than-leg condition, and then afterwards to have reverted back again to the present human and original leg-longer-than-arm.

The alternative is what has been stated above, that man did not arise from anthropoid stock at all, but branched off from the main stem of life before the pithecoid specialisations set in. This would afford a reasonable explanation for the retention of primitive features in man, and their modification in whole or in part by the monkeys and the anthropoids.

There still of course remain the likenesses to be accounted for. Here Wood Jones invokes the aid of convergent evolution, involving "not a wholesale parallelism in uncorrelated and non-adaptive features" but " a limited homoeomorphy of purely adaptive features such as are common to animals that being once arboreal, have become more or less terrestrial; that are more or less upright in structure, and more or less bulky in their general build."[1]

The general conclusions of Wood Jones seems to be borne out by Osborne. "The anthropoids constitute a separate branch of the great division of the primates..totally disconnected from the human family from its earliest infancy."[2]

The findings deduced from the facts of comparative anatomy are held to be compatible with the serological reactions of the blood of man and the anthropoids. Popular imagination pictures a genuine'blood relationship' between the two stocks. What is shown is that "while the serological differences between man and the lower monkeys appear to be no greater than those between the anthropoid apes and the lower monkeys, these findings confirm the opinion that the anthropoid apes do not rank in the same genealogical tree between the lower monkeys and man." These have all come from a common stock, but the proto-human emergence occurred in time to avoid

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1. Man's Place among the Mammals. p.329.
2. H.F.Osborne Evolution & Religion in Education. 1926.p.136

the stereotyping specialisations of the monkeys and the apes.

The final assessment of this 'evolutionary heresy' lies of course with those competent to deal with the technical anatomical evidence. It is admitted,however,that 'man is the ultimate product of that line of ancestry which was never compelled to turn aside and adopt protective specialisation either of structure or of mode of life,which would be fatal to his plasticity and power of further development."[1]

The different groups,after their divergence, were exposed to conditions which in the main were responsible for their fortunes-or their fates. We suggest that the real cause of the divergence of the manward headed stock was the presence of a potent urge towards the achievement of the richer life whose promise and possibility was latent in the stock. We might well leave this issue in the hands of Elliot Smith,who suggests that evolution reached a stage where "the more venturesome members of the group-stimulated perhaps by some local failure of the customary food,or maybe led forth by a curiosity bred of the growing realisation of the possibilities of the unknown world beyond the trees,which had hitherto been their home, we impelled to seek new sources of food and new surroundings on hill and plain,where they could obtain the sustenance they needed."[2]

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i. Elliot Smith.Essays. p.35
2. ibid. p.40

This urge to venture forth into the new country, at the call of the unseen , has increased in intensity as man has come to know his world better. We are reminded of another stage in human history when a similar urge was responded to. "Get thee out of thy country, and from thy kindred..unto a land that I will shew thee. And I will make of thee a great nation, and I will bless thee and make thy name great."[1]

"The less venturesome group, either more favorably situated, or attuned to their surroundings, living in a land of plenty, were free from this glorious unrest-and remained apes."[2]

The manward headed stock, impelled by the impetus of its own forward looking nature, was persuaded to 'forego the cash in hand', carried along by that insistent restlessness and discontent, which at its highest can declare, "Thou hast made us for Thyself, and our hearts are restless until they find their rest in Thee."

Interpretation of the Upward Climb.

Such, it seems to us, has been the upward climb towards man. When we come to evaluate this record, we confess to an opinion which others may not share, but which we are bound nevertheless to express. From first to last, the trend of evolution admits of but one interpretation, namely, that in the developing organic life there has been a genuine psychic function at work; and nothing short of continual reliance upon this

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i. Gen. 12. v1-2
2. Elliot Smith. Essays. p.40.

psychic factor could have proved the salvation of the organism at the various critical levels of experience through which it emerged.

The upward climb, from the first generalised marine forms in the warm shallows of geologic time, through the various orders and successions of life, has been accomplished only by a striking avoidance of the cul-de-sacs of specialisation. Only by keeping to the straight and narrow path of its destiny, and by selecting, in cooperation with its environment, those enriching features which fostered its integrity, has the organism arrived at the goal of distinctively human personality.

When the great life groups were diverging broadly along the lines of specialisation and stagnation, the manward stock ran a straight race, laying aside those things that might easily have beset it, pressing forwards to the mark of its high calling. Out of weakness, the feeble forerunner of the higher life has been made strong, preserved from the pitfalls of premature specialisation by meaningful contact with a creative environment. The spirit of God has always been striving with man. He has been, as Augustine declares, "at the helm, though very secretly."[i]

The glory and the worth of man lies not in his externals. Physically considered, man is weak and faint compared with most of his fellow travellers. But his feet are planted firmly on the highway of the spirit that leads to truth and life. What we shall hereafter be is hid from mortal eyes.

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i. Confessions of St. Augustine Bk.4. xiv. 23.

2. The Factor of Discontinuity in Human Evolution.

In our survey of the upward climb we have taken it as a basic fact that there is traceable all through the evolutionary series a very real continuity. The pedigree of man is well rooted in the ground plan of the developing system of nature, and its ramifications are inseparable from the order therein manifested. We have endeavoured to show that the 'natural element' in man's inheritance is inexplicable apart from the presence of an integrating psychic factor, which has unified his progressive experience and sustained the developing organism as every stage of its growth. This psychic factor is finally responsible for sublimating biological experiment into spiritual experience.

At the same time we have insisted that this continuity in the evolutionary series is strikingly enriched throughout its course by the outcropping of higher developmental levels which betoken the reality of qualitative differences within the series. These testify neither to 'breaks' in the thread of evolution, nor to 'spiritual influx' poured into the process from without, but to the fact that at certain critical periods of growth the organism, cooperating with its environment, uses the summed up experience of the past as a spring-board for leaping ahead in its race towards the final goal.

Organic evolution has moments of advance when it marches with seven-league boots.

Darwin based his main thesis on the fact of small chance variations, indefinite in number. On the evidence of today we must recognise variation as a very definite thing. What De Vries termed the mutation factor, while not the sole method of evolution, has nevertheless played a greater part in development than biology has been willing to concede. Continuity is now seen to be consistent with significant crises in the history of the organism, correlated with new departures in form and function.

Reviewing the 'Origin of Species' in 1860, Huxley suggested that 'Darwin's position might have been stronger than it is if he had not embarrassed himself with the aphorism, 'natura non facit saltum'." He went on to say, "we believe that nature does jump now and then." It is our opinion that this mutational or emergent element in evolution must receive fuller recognition as the facts of life come to be more fully appreciated.

Admittedly we are ignorant of the real causes of mutation, and we must be willing to be guided by whatever the fa/cts turn out to be. It might well be, as seems to be the case, that change, structurally or otherwise, is correlated with certain behaviour of the gene-content. Morgan sponsors the conception, derived from his 'bottle-raised-banana-fed' fly tha/t change of structure corresponds with, and is due to a

change in one particular portion of a chromosome. At the same time he rules out the effect of any external stimulus or condition.

But the organism is never at any time in its career anything less than an integrated organism,no matter how far back its history may be telescoped, and it functions always on the level of organic wholeness,not abstracted'geneness' Changes within the gene cannot be isolated from the total functional unity which characterises the complete individual, though they may quite well be a necessary physiological concomitant,or mode of expression instrumental to the organism's re-orientation. The germ-cell, with its contents, is inseparable from that restless experimental urge which inspires the upward striving life. It is in fact itself a complete organism, with the primary capacity of making experiments in self expression,'not a bag of items,but a viable unity.'

R.R.Gates[i] frankly realises the difficulty of accounting for mutations on a purely biological basis. His suggestion is valuable,namely that we have forgotten that the organism is alive. He draws an analogy between the climbing organism and an Alpine climber,swinging himself on to a ledge which is to be used as a new starting point in the upward climb. The language is admittedly picturesque,but it

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i. The Mutation Fector in Evolution.

serves to give point to our own suggestion that mutational change is fruitfully regarded as organismal reorientation, instigated by the pressure of accumulated experiences within the organism, to cope with environmental crises. We have seen Lloyd Morgan defining the fact of emergence in these words, "the emergent step, though it may seem more or less saltatory, is best regarded as a qualitative change of direction, or critical turning point in the course of events"[i]. This we believe expresses the valuable element in mutation, the power of the organism as a whole to make a new alignment of its direction, thereby achieving survival value in a critical situation. The continuity of the process is not disrupted, but it is charged with new meaning by the fresh departure.

We propose then to submit our evidence for the claim that on this basis the origin of man himself is intelligibly regarded as a mutational departure. In so doing we are aware that we are challenging evolutionary orthodoxy. Our defence is simply that the existing facts seem to us to be more reasonably explained than in any other way.

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i. Emer. Evol. p.5.

3. **Anthropoid Fossil Relics.and their Interpretation.**

Popular opinion,impressed by the broad generalisations of evolutionary theory,is uncritically based upon the supposition that between man and the rest of the primate stem there exists a well graded series of fossil connections, establishing an unbroken continuity, comparable to the fine series in the horse pedigree. Actually,the record of fossil primates is extremely fragmentary, affording no warrant for the deduction that there is a simple bridging of the immense gap between even the most primitive forms of man and the most advanced of the anthropoid apes. "It must be confessed" says Boule,"that palaeontology has not yet revealed any indisputable transitional form,any material proof of a hereditary connection between the ape-form and the human form".[1] Of the anthropoid fossils "there are from all geological periods,only a few score jaws and teeth,together with a single femur and humurus"[2], available for study.

For instance,"Palæosimia",the Upper Miocene fossil from India is represented by a single upper molar tooth. "Propliopithecus", the earliest ape so far discovered, found in Egypt and dated back to the early Tertiary period, is represented by a mandible with teeth. "Dryopithecus",the 'oak-ape' of the Middle Tertiary period, considered by many to be closer to the common stem of the apes and man than any other fossil ape, is represented by a few jaws,an arm and a thigh bone.'Australo-pithecus', the famous'big-brained baby'

1.Fossil Man. p.90.
2.Man's Place among the Mammals. p.285

from South Africa-of uncertain date-is evidenced by the facial part of a skull.[1]

We of course claim no technical ability to appreciate the detailed worth of fossil relics. In such a case only the expert may speak with decision. Let us hear then what he has to say. "In order to appreciate the nature of a fossil animal, and to assign it its true place..mere fragments of bone are not enough."[2] We ourselves would further suggest that the criterion of interpretation can be nothing less that the whole organism itself, more especially when we remember the significance of convergent evolution. The reminder is further required in the light of what Elliot Smith has to say;"In the evolution of man, the growth of the brain preceded the transformation of the face and body. The cerebral cortex acquired functions distinctive of the human status at a time when the organism as a whole still retained many simian characters."[3]

A singular illustration of the danger which is attendant upon generalisation from anything less than the whole organism is seen in the case of the now notorious "Hesperopithecus." It was announced in May 1922,[4] that a fossil

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i. for complete list c.f. Man's Place among the Mammals. p.285
2. Boule Fossil Man. p.91.
3. The Significance of the Peking Man. 1931. p.5.
4. Science vol.LV. p.463-5.

anthropoid of the Pliocene period had been discovered in North America. A new genus was invented to receive it, "Hesperopithecus Haroldcooki". The evidence submitted in support of this generalisation was a 'single water-worn tooth'[i]. Five years later, the expert who identified the tooth retracted his opinion. The 'upper molar of the extinct primate' degenerated into the 'upper pre-molar of an extinct genus related to the modern peccaries'. It is but fair to state that most of the experts protested at the time against the rashness of the generalisation,[2] but it prevailed nevertheless.

It seems reasonable to us to suspect that a study of such fragments as teeth, portions of jaws, skulls, isolated bones, etc, would be profoundly modified by the knowledge of the creature as a living organism. When full weight is given to the facts of physiological convergence, the danger of faulty generalisation is very much increased.

Certainly there is no evidence of direct gradation from anthropoid to human.

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i. Science. Dec. 1927. Vol.LXVI No.1720 p.579-81.

2. In the light of this criticism, all the more credit is due to the courage of Dr.Davidson Black for a similar generalisation which proved successful in the case of the Peking Man. But the criticism still stands. Dr Black had collateral evidence to support his generalisation.

4. The Antiquity of Man.

At what stage of the evolutionary development then may we look for the appearance of man. The time schema now becomes important, for discoveries in the antiquity of man naturally stimulated anthropologist and geologist to translate this antiquity into terms of years. The reading of the geological hour glass has not proved a simple task. Just how complicated the problem is, may be understood by a perusal of Arthur Holmes' excellent treatise.[i]

A roughly accurate chronology has been furnished through the mutually corroborative work of Wright in America, and De Geer in Sweden. During the Pleistocene period, the physical conditions in North America and Europe generally coincided. Glaciers, originating from three main sources, covered the whole of Canada and the north of the United States of America, with an ice sheet ranging from 1200-3000 metres thick. By measuring the cut-back on certain of the American waterfalls-taking their origin to be contemporaneous with the melting of the ice-cap, Wright reached an average figure which led him to set the birth of these falls- and consequently the close of the glacial period-at approximately ten thousand years ago.

Baron de Geer made an exhaustive study of the sediments laid down in Southern Sweden during the retreat of the last continental glacial of Scandinavia. "Every spring and summer, as the ice thawed, a great deal of sand and clay was

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i. The Age of the Earth. London 1928.

set free and carried away in suspension by the numerous streams that flowed from the melting ice. The coarser material, on reaching the sea, settled down at once, but the finest particles remained in suspension much longer. Then came the autumn and winter and the freezing of the streams. No further supply of sediment was received, and the load of fine mud slowly settled to the bottom, forming a film of clay, sharply distinguished from the coarser of sand below. The following year the ice again melted, and the front of the glacier retreated. Again two well marked seasonal layers were deposited. As the process continued year after year, the area of deposit moved northwards with the ice, and the annual twin bands of sediment thus became superimposed upon one another like wedge shaped tiles on a roof."[i]

These annual clay deposits indicated to the geologist what the annual rings on a tree indicate to the botanist, a method of measuring the passage of time. De Geer's work gave results closely approximating those of Wright, and they are generally accepted as exact over the limited period of evolutionary time involved. Hence it has been possible to date with fair precision the various stages of human cultures whose succession has been established.

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i. Holmes. The Age of the Earth. p.42

The corroborative findings of geology and palaeontology dispel any doubt that man existed in the pre-Glacial period. In 1909, J.Reid Moir, by his discovery of the rostro-carinate or 'beak-keeled' flints at Ipswich, made reasonably certain the existence of flint and fire-workers in the Pliocene Period. Supported from the first by Sir Ray Lancaster, Moir's discoveries were not acknowledged by other workers. Time however, seems to tell in his favour. Osborne, once sceptical, now accepts Reid's conclusions. Boule is not convinced that the flints were not produced naturally. Keith, in accepting the evidence, declares, "we shall now have to concede that evolutionary changes have moulded man during the Pleistocene period at a much more rapid pace than we have hitherto conceived possible." Osborne predicted the future discovery of 'large brained man' in the Pliocene period, and Keith concludes his "Antiquity of Man " with these words. "There is not a single fact known to me which makes the existence of a human form in the Miocene period an impossibility."[i] Boule, while holding that the evidence is not yet to hand, supports this declaration. "I am convinced that a being already in possession of the main physical, if not even psychical attributes of man must have existed somewhere during the Pliocene, and perhaps during the Miocene period."[2]

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i. vol.2. p.734. 2. Fossil Man. p.450
N.B. Vulliamy and H.Warren are still sceptical about the rostro-carinates. c.f Man. Jan. 1929.

5. The Argument for Human Origin as a Mutational Departure.

This increasing tendency to antedate the antiquity of man as man is significant. For the further back he goes as man the more abrupt must have been his emergence from the protohuman stock. In this fact we see suggestive evidence for his mutational origin.

When then did man first appear on the scene as man? Nobody can say for certain. But it is generally agreed that suddenly, without any indication whence he came, or who were his ancestors, there appeared in Europe a type of man whose remains are now relatively well evidenced, and whose place in the human culture succession, though not in the human pedigree, is definitely established-Neanderthal Man. Neanderthal Man was succeeded and displaced by Homo Sapiens. But time succession did not involve evolutionary continuity, for although Homo Sapiens came after Homo Neanderthalensis he did not derive from him. With the appearance of Homo Sapiens, evolutionary history made one of its most significant forward leaps. This, as Elliot Smith points out is the truly significant incident in the history of man, not the break between the Palaeolithic and the Neolithic ages, but "when the more nimble-witted Homo-Sapiens replaced the inferior type of Homo-Neanderthal-ensis"[i], at the commencement of the Aurignacian period.

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i. Essays. p.94-5

The Cro-Magnons.

Most remarkable of these earliest representatives of modern man were the Cro-Magnons. Living some twenty five thousand years ago, they have left striking evidence of their ancestry[1] in the animal decorated walls of their caverns. Their manner of burial testifies that the hope which springs eternal was not missing in them. The critical psychologist may see in their beautiful paintings but one more evidence of primitive sympathetic magic. We prefer to interpret this ancient artistry as man's first groping up the altar stairs to God.

In many respects they were the most perfect race physically of which we have any knowledge. Their men averaged over six feet in height-the skeletons of one old man is six feet four and a half inches. The women also were slightly above the average of today. The skull was very large, indicating a cranial capacity of about 1590 c.c. That of the modern European is about 1480cc.

It is seriously questioned if there has been any physical evolution since the first appearance of homo-sapiens. Indeed evolutionary theory is more and more inclined to recognise what Keith has called"the high antiquity of the modern type of man, the extraordinary and unexpected conservancy of the type."[2] This marked stability of the human species is one of the recent significant generalisations of anthropology. Its significance is evident when we realise

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i. c.f Baldwin Brown. The Art of the Cave Dweller.
Luquet. The Art & Religion of Fossil Man.
2. Keith; The Antiquity of Man. vol.i. p.265.

that if we were to omit the Neanderthal skull type, together with a few fossil relics-none of which is allowed a direct place in the direct ancestry of man-then the extreme differences between the oldest fossil men and modern man are relatively commensureable with the extremes exhibited by living races today.

Neanderthal Man.

Neanderthal man, the predecessor in time but not the ancestor in pedigree, of modern man, disappeared as abruptly as he came. Speculation as to his place in the pedigree of man has been interesting. The first thought that he might be a 'foundling', an individual monstrosity, was dispelled by the discovery of numerous skeletons. The great size of the skull, with an estimated volume of 1625 cc, the enormous bar across the eye region, the huge but chinless jaw, and the very low flattened head sloping back to the crown mark him out as an experiment rather than a freak of nature; but an experiment nevertheless doomed to extinction with the emergence of true man.

Neanderthal man passed through the crises of the interglacial period and was driven by the rigours of the ice age to adopt an almost exclusive cave habitat. It has been suggested that he might then represent a degenerate species of man, his physical peculiarities conditioned by overspecialisation in a kind of life that has been known to produce degeneracy in other forms. Others again, impressed by the

ameliorating conditions of civilisation, which, by succouring the weakly specimens of humanity have protected them against the weeding out of natural selection, have thrown out the suggestion that the degeneracy is not in Neanderthal man but in modern man himself. On this basis the appearance of the big brain in primitive forms would find a possible explanation.

Opinion, however, is generally agreed in this, that Neanderthal man belongs to some other species than homo-sapiens. A separate and peculiar species, associated exclusively with the Mousterian type of culture[i], physically a sort of "neer-do-well", he disappeared as abruptly as he came. "No modern ethnological group can be considered a descendant of Neanderthal man."[2] Big brained-ness, never at any time an infallible indication of genius, was in his case not conjoined with the qualitative factors necessary for survival. "His small pre-frontal region is sufficient reason for his failure in the competition with the rest of mankind". A humanoid cul-de-sac, nature in him refused to stand up and say, "behold a man."

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i. The fact that to date there is no evidence of art in the Mousterian culture is one more confirmation of the significant 'break' between Mousterian and Aurignacian cultures.

2. Boule; Fossil Man. p.245.

3. Elliot Smith. Essays. p.41.

Beyond Neanderthal man, the story of human antiquity is but fragmentarily suggested by a few brittle and fossilised pages which have managed to survive the passing of the years. We proceed now to turn back some of these significant pages in the book of eternity, to see if they will yield us anything of value for our conception of the worth of man.

Pithecanthropus.

In 1891, there were discovered in Java, certain fragmentary remains round the interpretation of which scientific disagreement still moves. In more remote times, when the prophet of Ezekiel stood contemplating the valley of dry bones, he was asked "Son of man, can these bones live?" Ezekiel replied, "O Lord God thou knowest".[i] One feels inclined to repeat the words of Ezekiel in connection with the bones of 'pithecanthropus', for they certainly have lived! The various interpretations suggested from time to time furnish excellent evidence for a study in the degree of subjectivity involved in fact finding. The circumstances surrounding the finding of the remains has had much to do with the conflicting classifications. The relics consist of a skull-cap, a femur and two teeth. One of the teeth was discovered in Sept. 1891; the skull-cap was unearthed about a month later, a yard away from the tooth; a year later, the legbone was discovered 50 feet away from the skull; later on a second tooth was

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i. Ezekiel. 37; 3.

discovered fifteen feet from the skull. It was a long time before their discoverer, Dr Dubois, consented to release these valuable fragments for international expert examination. It is not yet agreed that they all belong to the same creature.

In the largest anthropoids, cranial capacity rarely exceeds 600 cc. In normal man, it seldom falls below 1000c.c. The cranial capacity pf "Pithecanthropus" is estimated at 855 cc. The average European is 1480 cc. The femur of "Pithecanthropus" is about double the weight of the femur of a modern man of corresponding size, and it betokens an upright posture for the original. Gregory has declared the teeth to be definitely simian.

The find has proved a rare "bag-o' bones". The discoverer claimed for "Pithecanthropus" the rank of a direct missing link between man and the apes, regarding it as a direct ancestor of man. Boule considered the remains to be those of a giant ape, related to the gibbons, a conclusion supported by Smith Woodward, who suggested that man himself lived in Java, contemporaneous with "Pithecanthropus", the latter being a "gigantic and precocious gibbon".[i] Osborne believes "we have finally determined that it probably represents a condition of arrested mental development, but thst it belongs to the family of man and not to the ape family.. a dawn-man rather than an ape-man." This is typical of the attitude of Osborne who is moving more and more away from the "myth of our ape-ancestry".

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i. Elliot Smith. Essays. p.59
2. Boule Fossil Man. p.108.

Elliot Smith classified the skull of "Pithecanthropus" as belonging to the "earliest known member of the human family". This assessment may require to be modified in connection with the more recent discoveries of "Sinanthropus". Elliot Smith is also interested in the fact that the endocranial cast of "Pithecanthropus" reveals "a special expansion"of that area in the temporal region of the brain associated with the distinctively human faculty of speech. This, to quote the words of the famous anthropologist, can have only one meaning, "there was a sudden expansion of the acoustic territory for the appreciation of some sort of speech."[1] This, to us is an interesting conclusion, suggesting further evidence of the presence of the mutational development of the humanward characteristics. We have no way of estimating what degree of abruptness ought to be read into the words of the anthropologist, but frequent analogous expressions throughout his"Essays", suggest that he is strongly impressed by this sudden emergence, preparatory for the human faculty of speech. "Pithecanthropus" however cannot be regarded as a possible "jumping off" place for later true man since a direct place in the line of human ancestry is not conceded to him. He might prove to be merely "a degenerate descendant of a more primitive weaponless form, such as 'sinanthropus' seems to be."[2]

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i. Essays. p.150. 2 Significance of the Peking Man. p.6

Heidelberg Man.

The Heidelberg man, named from the jaw fragment found at Mauer, in Germany, in 1908, dates back to the dawn of the Quaternary period, that is, before the time of Aurignacian man. The heavy jaw lacks the chin development typical of true man. The teeth, if isolated from the jaw, might be attributed to a man "not differing in any important character from certain races of homo sapiens."[1] The form of the dental arches, according to Keith, are prophetic of Neanderthal man, not modern man. In consensus with the general opinion, Keith rules out both Heidelberg and Neanderthal man from the direct line of modern descent, suggesting that the teeth of Heidelberg man indicate a "specialisation for rough herbivorous diet", a "departure from the trend towards homo-sapiens", possibly towards Neanderthal man. Boule concludes that the creation of a special genus for both Heidelberg man and Neanderthal man is in order.[2] He significantly adds that "unilateral series appear to us more and more rare".

Eoanthropus; Piltdown man

Fresh stir was raised in 1912, by the discovery of the Dawn-Man, Eoanthropus, at Piltdown in Sussex. It seemed that at last there had been unearthed a genuine form intermediate between man and the anthropoids. Unfortunately, dogmatic pronouncement and exact reconstruction is precluded by the fragmented condition of the skull. Only parts of it

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1. Fossil Man. p.447. 2. ibid. p.448.

were recovered, and the fragmentary remains of Piltdown man were scattered, as in the case of the Javan relics, some yards apart. The first reconstructions of the relics, consisting of 3 teeth, a few fragments of skull bones and a portion of jaw which was unattached to the skull, made Piltdown man into a very ape-like creature. Later reconstructions, varying about the missing important parts of the brain case, have moved between a form extremely like modern man and the opposite extreme of anthropoid form. The general trend however has been towards the human.

The unattached jaw is simian in character. Boule held that it is still permissible to suppose that the Piltdown skull and lower jaw may have belonged to two different creatures", although he is not dogmatic on this point. Osborne, swayed by the discovery of later fragments in 1915, admits the affinity of the jaw and skull fragments. The molar teeth are declared to be definitely human. In 1928, at the Chou Kou Tien cave near Peking, there were discovered mandibles with an ape-like conformation of the chin region, associated with fragments of human brain cases of 'sinanthropus'. These mandibles are generally, though not generically, related to the Piltdown jaw and on the reasonable assumption that the 'sinanthropus' fragments belong together, it is legitimate to infer that the Piltdown jaw and skull likewise belong together.

Estimates of the brain capacity of Piltdown man have varied all the way from 1070 to 1500 according to the bias of the reconstructor. It has been finally placed at 1240 by Elliot Smith. The skull itself is now held to be much too like that of modern man for the title of Dawn-Man to be anything more than a 'convenient label'. Piltdown man is not in any sense a link between man and the anthropoids. Keith has concluded that he is 'little if any the inferior of the modern Australian'-whose estimated cranial capacity is 1250cc.

Rhodesian Man.

The Broken Hill Mine in Rhodesia yielded valuable tribute in 1921. No very certain date is yet assigned to Rhodesian man, the remains being improperly mineralised owing to the presence of certain salts and lead, and to the fact that that the geological associations of other local finds are not yet definitely established.

The Rhodesian skull is very striking, with the enormously developed eye ridges of the primitive type, and in addition a greatly enlarged face region. This fossil skull exhibits affinities with Neanderthal man, but according to Keith, Rhodesian man is on the whole much closer to the modern type, branching off from the main stem at a later date than the Neanderthal stock. His estimated cranial capacity is 1280. But his divergences from modern man are too great to admit him

as a forerunner. The 'skeletal excrescences' manifested in the heavy eye ridges and the specialised enlarged face betray the owner as one of a race which has run its course.[i] Rhodesian man is admittedly but another humanoid cul-de-sac who gave rise to no higher stock. The way of the specialist is hard.

Sinanthropus.

Within the last few years, most important discoveries in connection with fossil man have been made in China, near Peking. The discovery is the climax of a long systematic search, spread over many years by international experts. The finding of two teeth, in material excavated from the now famous Chou Kou Tien cave, some years prior to the main discovery, prepared the way for it. The evidence converged upon the conclusion that in Eastern Asia, towards the close of the Tertiary period, or the beginning of the Quaternary, there existed either man or a closely allied anthropoid type. This would coincide with Pithecanthropus in Java, and Piltdown man in southern England. A little later, Heidelberg man would be in the vicinity of Mauer in Germany.

Further discoveries of teeth and mandibles and fragments of brain cases were overshadowed by the great discovery of December 1929-an uncrushed and almost complete skull. This was supplemented the following July by the reconstruction

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i. Science Progress. Vol.xvi. p.576.

of a partial skull from fragments discovered , thus affording valuable data for comparison. The first skull is possibly that of a male, the latter that of a female, both being of the age corresponding to a modern eighteen year old.

Professor Elliot Smith, whom the writer was privileged to hear lecture on this discovery, after the famous anthropologist's return from'a period of ancestor-worship' in China, regards the find as "the most significant and illuminating relic of primitive man ever discovered." The uncrushed brain case permits deductions free from the doubt which naturally gathers around'reconstructions' .

The skull of 'Sinanthropus' is interesting in its affinities as well as in its uniqueness. With 'Pithecanthropus' it sha-res the extremely heavy eye ridges belonging to the very primitive type. With'Piltdown man' it shares an extremely thick cranium,whose presence in primitive forms is still a puzzle to the anthropologist. On the other hand, "Pithecanthropus has a relatively thin skull, while in 'Piltdown man' the heavy eye-ridges are missing. In addition, the Peking skull exhibits features unknown to these other two, such as the 'peculiar form of the ma-stoid region of the temporal bone." The year before the finding of the complete skull, portions of two lower jaws,and brain ffagments, were found. The chin region of the jaws is held to resemble generally-though not generically-the ape-like

condition in Piltdown man. Davidson Black has shown that 'the condyloid fossa for articulation with the mandible presents a very close resemblance to the condition found in modern man, in size, depth and direction'. Rhodesian and Neanderthal man have attained marked divergence in this respect.

The conjunction of ape-like jaw and human brain does not of course vitiate the essentially humanoid character of 'Sinanthropus'. Indeed Elliot Smith hails the 'Man of Sin', as one more corroboration of the fact that 'in the evolution of man the growth of the brain preceded the transformation of the face and body. The cerebral cortex acquired functions distinctive of the human status at a time when the organism as a whole still retained many simian characters."[i]

From its general skull contxour, "Sinanthropus" is tentatively regarded as intermediate between 'Pithecanthropus' and Piltdown man, but more primitive and generalised than either of them. But it is humanoid, not anthropoid, and this 'most significant relic of primitive man' shares that degree of large brainedness which separates even the most primitive humanoid form from the most highly developed anthropoid.

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i. Significance of the Peking Man. p.5.

Factors Suggesting Mutational Origin of Man.

Such in brief are the main facts concerning man's origins, to be gleaned from the dusty pages of pre-history. When we come to assess their significance for our conception of human worth we find a very interesting situation. In the first place, it must be confessed that the fossil witnesses to man's history in the evolutionary series are extremely fragmentary, one might almost say precariously so, and of course barred by the very limitations of their fragmentary nature from dogmatising as to the quality of the total life character of the creatures whose remains they are. When everything that must be allowed has been allowed to human expertness in reading the signs of the times, it must also be remembered that isolated teeth and jaws and skulls, highly significant though they may be to the anthropologist, are not infallible guides to the interpretation of the kind of life that once functioned in these earthly mansions; more so is this to be remembered when we ponder the full implications of Elliot Smith's caution that the cerebral cortex acquired its distinctively human functions in advance of the appearance of the human form in face and body. This is anthropology's latest testimony to the intuition of religion in its assessment of man's worth, that the body is more than meat and the life more than raiment.

It has also been driven home with increasing emphasis that the antiquity of man as man goes back very much farther than was previously thought possible. We have seen Keith close his survey of evolutionary history with the statement that "there is not a single fact known to me which makes the existence of a human form in the Miocene period an impossibility", and Osborne predict the future discovery of big-brained Pliocene man. Each new discovery compels the anthropologist to turn back the hands of the geological time-piece. Man as man is incredibly ancient.

Here then is food for thought. The more we go back into the evolutionary history of man as man, the further he goes back into geologic time. Now the farther he goes back, the more compelling looms up the thought of his abrupt emergence in the evolutionsry series-and the type has manifested to date a remarkable stability.

True man appears suddenly down the corridors of time, distinct from and unique among the humanoid forms whose respective specialisations have canalised their human potentialities into the rut of annihilation or degeneration. When he appears, he is as distinctly human as he is today. The tendency to antedate his emergence strengthens the idea of his mutational origin

Let us swiftly survey the course. Anthropology is unanimous in recognising an extremely early separation of the primitive types which moved in the one case apewards

and in the other case humanwards. There is no cross-over creature. Keith places the separation in pre-Miocene times.[1] Dr. Pilgrim has shown that during the Miocene period the Asiatic anthropoids were diverging in all directions, including "sivapithecus" and "dryopithecus". But "the Miocene anthropoid apes offer us no form which can serve as a probable human ancestor."[2] We have also noted Wood Jones' resolute argument for a complete rejection of the anthropoids from the human pedigree.

Sir Ray Lancaster has pointed out that in Miocene times-when the significant manward departure may have been established-there was a great increase of brain in several other mammals, such as the elephants. Nature was evidently being stimulated-by what environmental pressure we cannot now say-to experiment with the "tendency to big-brainedness"; she was even then pregnant with the potency of future man, but her time of delivery was not yet fully come.

Keith has said that "the ancestors of the big-brained races of fossil man need not necessarily have had a big-brained common ancestor; all we need to suppose is that in the stock there was a tendency towards big-brainedness."[3] We suggest then that the records of fossil man are cul-de-sac types, abortions in

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1. Antiquity of Man. p.732
2. ibid p.730
3. ibid. vol.i. p.xvii.

nature's labour to give birth to true man. For the most part, they failed to establish themselves, being sidetracked into various specialisations, at the cost of extinction. Yet side-tracks though they be, these abortive types share with true man a common denominator, found in big-brainedness, the characteristic par excellence of the humanward stock, which was seeking expression and finally achieved in homo sapiens. The leap into big-brainedness is the mutation which seals man's break with his sub-human progenitors.

Recent discoveries of such forms as the Boscop, Wadjak and Talgai types, point to the fact that at some early stage in the evolutionary development of man, there was a period when the stock was "phylogenetically rioting", diverging-might we suggest mutating-in many directions, most of the resultant types failing to establish themselves. "It is by no means essential to consider that every known type of early man represents a stage in the evolution of man as we know him today."[i]

What degree of abruptness may be read into these divergences remains to be seen, but nature is full of paradoxes, surprising us by the swiftness of her leaps as well as by the slow piling up of infinitesimally small differences.

Nature can leap when she has to. Elliot Smith points out that after the negro had separated from the main

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i. Man's Place among the Mammals. p.362.

stem of the human family the amount of pigment in the skin underwent a 'sudden' and very marked reduction.[1] We have already noted his interest in the 'sudden expansion'cf the acoustic territory for the appreciation of speech in 'Pithecanthropus'. Even the anthropologist is impressed by the swiftness of some of nature's moves.

The tempo of evolutionary development is plentifully staccatoed with critical moments when the smooth flowing rhythm of leisurely advance is quickened into newness of life. It was the belief of W.H.R.Rivers that there was a sudden leap forward at the birth of intelligence. Instinct and intelligence were held to connected with separate parts of the brain, and at some definite period, intelligence suddenly appeared, and was grafted on to instinct.[2] Romanes stressed the same abrupt emergence, "a critical moment when the soul first detaches itself from the nutrient body of its parent perceptions,and wakes up in the new world of a consciously individual existence."[3]

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i. Essays. p.24
2. G.B.Dibblee in "Instinct & Intuition" gives an interesting account of the work of Rivers.
3. Mental Evolution in Man. p.208.

Professor John Dewey[1], who has completely assimilated the philosophy of evolution in his educational work, builds upon the thesis that thinking takes its departure from specific conflicts in experience which occasion perplexity and doubt. Ideas, meanings, and conceptions are merely instruments to an active organisation of the given environment. The brain is primarily an organ of behaviour; reason begins not so much with premises as with problems, and is successful insofar as it disposes of the problem. Bergson also maintained that reason was an adaptive organ developed 'ad hoc' for the convenient handling of environmental situations, an instrument for coping with reality.

Our own suggestion is that the 'inherent tendency to big brainedness' which finally eventuated in man was spurred into speed at some critical moment in evolutionary development. The relatively swift geological changes in early times would play their part in providing penetrating environmental problems for the developing life. If we are compelled to be specific, suggestions of such environmental perplexity are not wanting in the disturbing conditions that prevailed in the oncoming ice age. The life surge in nature and creature, threatened with annihilation in the problem of

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1. Dewey's philosophy is best accessible in the following.
   Creative Intelligence. 1917.
   Reconstruction in Philosophy. 1920
   Human Nature and Conduct 1922.
   'Essays in Experimental Logic' 1916 gives a good statement of the 'instrumental' view of mind. cf. Ch. I.

of a new environment, was obliged to make a swift and new alignment of its forces. The slow piling up of chance variations would not be of much avail for ensuring survival of the kind of life that was being preserved in the proto-human stock. Preserving the primitive plasticity of the biological drive-and this original plasticity in early times would be enhanced over present day conditions so that mutation on a larger scale is quite conceivable- urged on by the inherent tendency towards higher survival, the ancestor of man literally rose to the occasion, discovered in the stress of the situation a successful adaptation, and man was born. His ability to cope speedily with difficulties on a higher level than the strictly biological guaranteed his fitness to survive. His anthropid contemporaries, lacking that specific inherent psychic integration which has singled out man for distinction, specialised along other lines, or perished. Man's humanoid prototypes, competitors it might be in the struggle for existence, are grim witnesses to nature's determination to save at all costs her valuable progeny. But they are seen now for what they are, abortive experimental efforts to give birth at all costs to the labourings of the 'big-brained' tendency; or they may be backward surges of a mutant type not yet sufficiently rooted and grounded in the biological situation. "After many experimental types of the human family

had occupied the world for thousands of years, the genus homo emerged, and in course of time gave birth to several species. Eventually one of the species attained exceptional skill and intelligence and acquired the cunning and wit to surpass all its fellows and to supplant them completely".[i]

After many miscarriages, nature could stand up and say "ecce homo sapiens! "

We have never seen any correlation worked out between the survival ages of the various humanoid fossils and their respective positions in the evolutionary scale. It would not be surprising to find that there was a progressive increase of age span from bottom to top. Significantly enough the remains of the most generalised type yet discovered, 'sinanthropus', correspond to a modern 18m year old pair. In the same cave there were also discovered a brain fragment judged from its thinness to represent that of a child. Why should 'sinanthropus' have perished at such an early stage of life? Was the upward surging life of man unable in the first experimental output to combine longevity with swift new adaptation? The anthropoid reaches its brain maturity in a mere two years; the humanoids extended the time span increasingly-like spurts out of a hose under increasing pressure-until in homo sapiens it reached its destined expression. Eventually when sufficient

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i. Elliot Smith; Essays. Human History. p.68

progress had been made towards longevity, a new criterion of survival emerged. Extension was overlaid with intensity. Nature made a new leap from the physical over into the spiritual.

Discontinuity in Nature. In seeking to ground the nature of man as a strictly new departure on mutational basis-and thus to discover even in his origins evidence of his worth-we are not doing violence to a method of development which is seen more and more to have a significant place in the whole economy of nature.

"It is my belief" declares Lloyd Morgan, "that in the broad domain of nature, from bottom to top, natural leaps are many, so many that I have ventured on occasion to speak of the advance of nature as fundamentally jumpy."[1] Again, "what is essential to the idea of evolution is upward passage, by progressive steps-sometimes very little steps-sometimes big jumps-along definite recognisable lines of advance, with continuity of progress from lower to higher. And of evolution in this sense there is evidence in molecules, in organisms, and in social institutions."[2]

It is one of the modern mysteries of physics that an electron, which is swinging round a nucleus in a definite orbit and in a perfectly uniform manner, may suffer a sudden jump from that orbit to another, emit a quantum of energy, and then pursue its new orbit once more with complete uniformity. We are reminded also by Whitehead that 'it is well to remember that the

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1. Evolution in the Light of Modern Knowledge. p.108.
2. Creation by Evolution. p.343.

modern quantum theory..is only the latest of a well marked character of nature." The basal surge of life seems to be of such a kind that we cannot be sure that any new product of a developing series will not express itself in characters of which its antecedents give no sign. And the new characters are just those which give meaning and significance to the whole antecedent development.

A familiar illustration of 'jumpiness' is the emergence of the new qualities in the case of the chemical compound H_2O, in which hydrogen and oxygen combine under certain conditions, and in certain proportions to form a liquid emergent, water, this emergent exhibiting very different properties from those of either of its gaseous components.

Water in its turn, maintains its specific nature as water inside the temperature series between freezing and boiling. But as soon as these critical stages are reached, again a new alignment takes place, in the resultant ice or steam, these again being characterised by qualitative differences which could not be deduced before they had actually emerged.

The characteristic behaviour of the new whole is not derivable from the most complete knowledge of the behaviour of its components, taken separately or in other combinations. Knowledge, for instance, of the properties of sodium or chlorine, by themselves or of any of their respective compounds, will not

reveal the properties which emerge with common salt. The new phenomenon must emerge as itself before it can be fully evaluated. The emergence may have to be taken as an unanalysable datum of experience, but its significance can be estimated only in terms of the forward movement of life, and in terms of its own distinctive wholeness and originality, not in terms of antecedents.

Hence, just as we recognise in physics and in chemistry the presence of 'incremental lifts' where alterations of quantity suddenly involve alterations in quality, so too with living organisms the persistent 'overcharging' of experience- in which the vitalising features of environment play their own part-may lead to sudden qualitative changes. It is significant for our thesis that this is the case in the development of the nervous system. "We see a succession of steps, rather than a gradual advance, and at each step a fundamental change suddenly appears, mutation-like in its character..each step is a new phase in organisation, but not necessarily a change in the kind of materials involved."[1]

It would seem then, as if all along the ascent of life, the continuity hitherto demanded by science and philosophy were broken by sudden leaps into newness of life. "Continuity of process, and the emergence of real differences- these are the twin aspects of the cosmic process."[2]

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1. G.H.Parker. in "The Evolution of Man" Lull et al. p.102
2. Pringle-Pattison The Idea of God. p.103.

To sum up then, our belief is that an analogous condition may be argued to explain man himself, for whose emergence on a mutational basis we have contended. We are not vitiating the principle of continuity in maintaining that development has been made creatively progressive by new and abrupt starts from time to time, and in further claiming that each new departure carries within its own genius the norm of its own interpretation.

It is fully agreed that the line of man's pedigree goes far back into the distant dimness of antiquity, traversing it may be the common stem of primitive life. But it is also maintained that the worth of a man is not analysable into the so-called brute factors of his inheritance.

With the new synthesis which established itself as man-a synthesis in which the mental functioning pushed ahead of the bodily medium-came the cross over into the new possibilities of the fuller and more abundant life. The essence of the new synthesis was self-consciousness, in some degree of articulateness. In this core of self-consciousness was buried the potent seed of the moral conscience, unique in man, but requiring to be progressively expanded and nourished through the new opportunity afforded by communal intercourse.

Arising out of stress and struggle and perplexity, accompanying the self-consciousness which emerged in the struggle for biological survival, it is but 'natural' that the moral consciousness itself should necessarily be developed through conflict and crisis.

In our opinion, the spontaneity of the organism is not violated by the presence of a mutational element, which to some, suggests that a sort of biological necessity has been imposed into the scheme of things. In all experience there is necessity as well as freedom, an element of givenness within which the organism retains its autonomy of expression and action. Somehow, behind all evolutionary development there must be the strictly eternal, the objective background in cooperation with which all things are made new.

Religious experience, in judging the worth of a man, makes full confession of this objective background when it declares that in God man lives and moves and has his being. Every feature of experience includes more than its local expression; every event is an actuality by reason of its affinity with The Event; every moment has dynamic time significance because of its ultimate inseparability from the Eternal.

The appearance of the genuinely new is ~~itself~~ a sign that the heart of the developing process of nature is itself pulsating with life. The human organism is in touch with a God of the living, not a God of the dead. It accepts from the process as well as contributes towards it, and within the wider sphere of God's environing, it develops its creaturely freedom. The summum bonum of survival fitness is the expenditure of the maximum of freedom and efficiency in relation to the divine necessity, operating in and through the social milieu.

SECTION THREE

1. Evolutionary Psychology and Human Values.

Our investigation of evolutionary origins has furnished us with a valuable principle of interpretation, namely that each new departure, and more particularly the new departure which eventuated in the distinctly human, carries within itself the key to the riddle of its own nature.

Pope was right when he declared that "the proper study of mankind is man". Anthropology is an indispensible propaedeutic to perspective, but history must always cooperate with psychology, since the creative resultants of time's forward **match** are living organisms functioning as active life-wholes, constantly in touch with a dynamic environment.

We hope to arrive at the conclusion that even psychology has to be supplemented by richer categories where the worth of man is concerned. We proceed therefore, to an examination of the implications of evolutionary psychology for the Christian doctrine of human worth.

Modern psychology strikes its roots deep into the period of enlightenment which marks the emergence of the spirit of man from the intellectual thraldom of mediaevalism. The subservience of life, marked by humility, and allegiance to external authority, coupled with a conviction of the unimportance of the present moment, gave way to a sense of the worth and dignity of human life, and a recognition of man's independence.

In every realm of experience, institutionalism surrendered to individualism; 'natural rights' were exploited to the limit and human reason became the final court of appeal.

Bacon. To Francis Bacon this forward movement owes much of its initial impulse. His reaction against the speculative methods of classical inquiry impelled him to the method of objective induction. Protagoras had long before claimed that man was the measure of all things; Bacon now retorted that on the contrary 'all the perceptions, both of the senses and the mind, bear reference to man, and not to the universe, and the human mind resembles those uneven mirrors which impart their own properties to different objects...and distort and disfigure them."[1] Obviously then, before man could aspire to the truth that would set him free there was required a tearing down of these 'idols' of the mind which keep men from discovering the truth; inquiry must begin with impressions and not with fantasies.

To this expurgation of the human intellect the Novum Organon was dedicated. The method of objective induction, intended to set science free from the idolatry of anthropomorphism, was initiated; it seems not unfair to say that the most far reaching result of the new method was that beginning of the overvaluation of method and undervaluation of personality which is running itself to seed in the present day.

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[1] Nov. Org. i. 41.

Locke.

In philosophy it was Descartes who initiated the rationalism which declared that truth was to be known only by its clearness and distinctness. In psychology it was John Locke who applied the inductive tests and methods of Bacon. In Locke's 'Essay on Human Understanding', reason for the first time in modern thought turned round and had a good look at itself. The result of this self-criticism was not very complimentary.

For long it had been considered as axiomatic in religious thinking that the mind of man at birth was endowed with innate ideas of right and wrong, of God and immortality, which ante-dated all experience. Locke,however, in his review of rea-son,maintained that "there is nothing in the mind which was not first in the senses". Far from the mind being endowed with innate ideas which guaranteed its integrity, it is at birth nothing more than a "tabula rasa", a clean slate, on which sense experience writes its messages; eventually memory is born of sensation, and ideas of memory.

For religion, the startling conclusion of the Lockian psychology seemed to be that only material things could affect the senses; hence knowledge is ultimately sensation. If sensations are the substance of thought,then apparently matter is the stuff of mind. That is to say, we are confronted by the interesting circumstance of modern psychologising taking its rise in a theory of knowledge which endeavoured to part company

with the psyche it started out to investigate!

Berkeley. Berkeley hastened to rescue religious values
Hume. from this materialistic impasse, by declaring triumphantly that matter itself existed only as a form of mind. But the Irish Bishop Berkeley fell a logical prey to the Scotch sceptic Hume, who ingested Berkeley's'mind' just as effectively as Berkeley had a/ssimilated Locke's'matter.' When Hume was through, neither matter nor mind was left; all we have is separate ideas and memories and feelings, their'unity' accounted for on the principle of 'association of ideas'. There is no observable soul behind the processes of thought.

It is scarcely to be wondered that some wit summed up the debate with the bon-mot, 'no matter, never mind."

Kant. Kant, startled out of his'dogmatic slumber' by this attack on the integrity of the human reason, challenged this psychology in the opening sentences of his 'Critique of Pure Reason'. "Experience(sense) is by no means the only field to which our understanding can be confined."[i] To the Humian assertion that 'what we call mind is nothing but a heap or collection of different perceptions, united together by certain relations, and supposedly, though falsely endowed with a perfect simplicity and identity"[2], he opposed the contention that the mind of man is neither a passive wax on which sensation writes its whimsical will, nor a mere abstract name for a series of

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i. Müller's trans. Intrc. p.i.
2. Treatise. Bk. i. pt.iv. Greem & Grose ed. p.495.

mental states; the mind is an active organ which moulds and coordinates sensations into ideas, and transforms the chaotic manifold of experience into the ordered unity of thought. Sensations have unity with reference to the self which unifies them in accordance with the categories of understanding. Locke was wrong in holding that there was nothing in the mind which was not first of all in the senses. Leibnitz spoke the truth when he added, 'nothing but the intellect itself'. For 'percepts without concepts are blind' and it is the 'understanding which makes nature.'

Hume might well have smiled however, had he been able to see the final result of Kant's analysis of pure reason. For all the world and the nature we can know according to Kant's reason resolve into phenomenal appearance only, not the real thing. Moreover when reason tries to spread its wings and essay a flight into reality, it becomes entangled in the web of the antinomies, and falls back helpless. Kant had saved the mind of man, but had sacrificed the reality of his world, the reality of God, and the reality of freedom and immortality. Reason could never affirm these realities.

Kant's escape from this apparent scepticism of pure reason lay in confirming through the practical reason the innate moral convictions of truths which could not be rationally apprehended; in the a priori absolute moral sense

and the autonomy of the categorical imperative we have a foundation of faith which cannot be overthrown.

Kant's refutation of the Humian scepticism was boomerang-like in its effect. His phenomenology of nature gave hostages to the agnosticism which worked itself out through Comte and Spencer. Yet there was a much more serious consequence of the claim that the real world of nature was not necessarily connected with mind or understanding. It became the fashion in science to treat nature in a thorough-going 'objective' way, ruling out of court any 'intelligent' interpretation of what might seem at first sight to be teleological adaptations in nature. Nature became a vast machine rather than a living organism; hence it was logical to rule out creaturely striving as a scientific category.

We have already noted the vindication of creaturely agency through the philosophy of James Ward. We are content to leave to other branches of present day science the rehabilitation of nature in terms of what can be construed only as some analogue of immanental mind and spirit.

Behind the reasoning from Descartes to Kant there lay the assumption of a 'finished world as an independent fact, and an equally independent knower'. On this basis it was possible to preserve a certain integrity for human values in

spite of whatever interpretation was set upon the natural world. Human values were not necessarily grounded in natural values. Man and nature had only a nodding acquaintance,not a real kinship.

But the developmental psychology was steadily gaining ground, leading to the inescapable conclusion that man was organic to the whole process of life, not an 'ab extra' insertion into it. Kant had argued strongly for the moral uniqueness of the human spirit. Yet in 1798, in his 'Anthropology,' he had suggested the possible animal origin of man, arguing,- after the fashion of Anaximander- that if the human infant had cried as loudly in primitive times as it did at present, it could never have survived the attraction of wild beasts; hence man must at one time have been different from his present condition. "How nature brought about such a development..we know not..this suggests..whether the present period of history..may not be followed by a third,when an orang-outan or a chimpanzee would develop the organs which serve for walking,touching, speaking, into the articulated structure of a human being,with a central organ for the use of understanding, and gradually advance under the training of social institutions."

This hypothetical reasoning into the future, to avoid the implications of a direct statement is

but one more indication that the eighteenth century was scarcely ready for a direct statement as to the evolutionary origin of man.

2. **Evolution Related to Human Values.** All restraint, however, was thrown aside half a century later. By the middle of the nineteenth century, in 1858, the papers of Darwin and Wallace were read before the Linnaean Society. The following year, the theological framework crashed under the pressure of the 'Origin of Species'. Evolutionary psychology suggested irresistibly that the theory of an a priori innate moral sense in man had to give way before a concept of duty which was simply a social deposit in the individual. Conscience was acquired, not implanted; the moral self was not a creation by divine fiat but the latest product of a leisurely evolution. Man, at the last, was simply a 'sophisticated brute'.

The work of Darwin and Wallace convinced thoughtful people that there had been a gradual evolution of animal forms. Spencer had already advanced a philosophy which included the evolution of mind. Wallace refused to go to this conclusion. His reasons for differing with Darwin here are still worth considering in any discussion of the evolution of the mind.

What was not seen at the time was that the fundamental problem to be reckoned with was not the fact that the human mind and personality had a genetic history, but that

the processes of evolution were such as to be able to eventuate in man's moral and religious personality.Man's affinity with nature, as we see it now, need not lower the dignity of man; what it ought to do is to compel us to evaluate more profoundly the process that has produced him. The end result of evolutionary interpretation is not a naturalised spirit but a spiritualised nature.

Christian thinking still refuses in some quarters to give complete recognition to the fact of man's organic relationship to the developing process of creative evolution. Behind the hesitancy there seems to be a fear that such recognition would dull the lustre of man by equating his religious personality with the life of the brute. Actually the final identification of the two natures had been made long before the nineteenth century. "Men are no better than beasts; man's fate is a beast's fate...the same breath is in them all..both are bound for the same end; both sprang from the dust and to the dust they both return."[i]

One way out of the dilemma is to make such a separation between history and value as will permit validity in the one without prejudice to the conclusions of the other. This is to seek the religious worth of personality in a sphere which dangerously abandons the realm of fact. Ritschl, more than any other, in modern times, has drawn the sharp line

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i. Eccles. 4; 18ff.(Moffatt)

of opposition between 'theoretic' and 'theological' knowledge, thereby preserving the soul at the expense of the body. For our own part, the absolute divorcement of science and religion can have but one ending, intellectual suicide and attenuated moral subjectivism. It is no longer possible to interpret factual experience apart from value experience, and vice versa; to do so is to shut God out of the kingdom of man, and man out of the Kingdom of God. "The Christian who thinks cannot keep God in his soul and leave him out of his world."[1]

On the other hand,it would be equally false,in our opinion, to surrender human values to science, whether it be biology, or a-nthropology or psychology.[2]

The only course open to a religious interpretation of personality, when it finds itself thus assailed, is to welcome facts whenever and wherever these are forth-coming,to evaluate these facts critically in the light of the general accumulation of experience, and then to go beyond the related facts to their cosmic meaning. It is we believe of supreme importance that Christian philosophy should recognise man's organic affiliation with the whole of nature; the facts warrant no other conclusion; but facts have meaning; the analysis of our organically grounded personality reveals such highly unique and significant qualities in the 'child of nature' that we are compelled to go back and take a more discriminating look

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1. Sorley. Moral Values & the Idea of God. p.472.
2. The relation between scientific and religious experience is dealt with under Heim's Perspective Figure.

at the mother of such a child. In the light of man's moral status, nature herself becomes spiritually significant as the fertile medium eternally pregnant with the potency of giving birth to, and nourishing religious personality. For man is at once in nature and yet above it; we are in the world and yet not of it, bone of its bone and flesh of its flesh, yet bonn of the spirit. In the last analysis man can say naturally to his earth mother what Jesus could say profoundly to Mary, "Woman, what have you to do with me."[i.]

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i. John. 2;4.(Moffatt)

3. The Uniqueness of Man. Psychic. not Physical.

It was Schopenhauer who opened the eyes of psychologists to the omnipresent force of animal instinct in human life-a conception which we shall have to examine at a later stage. Someone has said that the conception of man as above all a thinking animal consciously adapting means to rationally chosen ends,"fell sick with Rousseau, took to its bed with Kant, and died with Schoperhauer." But it was Huxley who drove the logic of evolutionary psychology to its illogical conclusion,when he declared pessimistically,"man is merely a brute, only more intelligent than the other brutes."

Let us look carefully then at this animal-human affinity[i] which in the eyes of many has tended to prick the bubble of human conceit.

It is obvious that man's true worth and his claim to superiority over his animal congeners cannot lie in his physical being. Of all creatures, man is one of the least well adapted physically to cope with his natural surroundings. Viewed merely as the product of a natural line of evolution, man is a misfit in the world. As Anaximander and Kant have pointed out,his very helplessness in infancy would limit his survival possibilities in the struggle for life. He has had to overcome this physical handicap by an ever increasing reliance upon and cooperation with his mental and spiritual qualities,combined with the symbiotic sociability which makes him unique in the animal kingdom.

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i. Darwin in "Descent of Man" 1871 held "there is no fundamental difference between man and the higher mammals in their mental faculties."

Examination of the "Animal-Human" Relationship in Psychology.

This ability of man, to surmount the handicaps of his physical limitations, and to conquer his environment, is not the least mark of his distinctive worth. History reveals man as the only animal successful in adaptation to its environment which has confirmed its place and established its dominion by imposing upon natural life an artificial life. Man is the only animal to invent and develop the use of tools, thereby ensuring his ability to rise superior to the conditions of his natural estate. From the use of mechanical tools he has progressed to the use of spiritual instruments, developing his own mental imaginings and creations. In some cases he has even externalised his own intuitions to the extent of bowing down before them, either in superstition, or in genuine fellowship with the object of his adoration; he has become astronomer, philosopher, artist, poet, genius, prophet, saint. Finally he has overcome the will to live by his willingness even to die for some of his intuitions, and has thereby superimposed upon the survival of the fittest the higher hypothesis that the life which is life indeed might be gained through loss.

It is this inherent urge within man to become, and not to be, that erases the mark of the beast from humanity and sets upon it the seal of divine sonship. Elliot-Smith states that 'apes are probably just as well equipped

as we are to see, but they lack the fuller cerebral equipment to interpret the meaning of what they see" [1].

Surely the equation of the animal and the human is negated in this very obvious fact. The mind of the 'mere animal' interprets its experience simply in the connection of events through perceptive association of ideas; animal minds never reason back to cause and effect; hence baulked expectation in the animal expends itself in a temporary sense of felt discomfort, not in a cosmic disharmony such as compelled Augustine to declare, "Thou hast made us for Thyself, and our hearts are restless till they find their rest in Thee." [2]

The mind of the animal is concerned almost wholly with a day-to-day and a hand-to-mouth existence; the distinctive feature of the mind of man is that in his passion for life and existence man has succeeded in enjoying the communion and fellowship of that extrahuman environment with which he has discovered himself to be involved. This, no other animal has ever attempted to do.

It is this restlessness of outreach, this sense of constantly moving towards and being drawn towards some meaningful end as yet hidden from him, this drawing

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1. Human History. p. 44.
2. Confessions. bk.1. 1.i.

out from the storehouse of his spiritual possibilities the treasures of his latent life, which marks man off completely from the animal. The 'divine discontent' belongs only to man. "The foxes have holes, and the birds of the air have nests, but the son of man hath not where to lay his head."[i]

As a matter of simple psychological fact, our notions of animal mentality are precariously artificial. When we are dealing with mental processes, there can be but one norm of interpretation, our own human experience. No other is possible. Consequently, while it may be helpful to explain certain behaviour of the higher animals by analogy with human behaviour, it should be remembered that it is not a valid procedure to reverse the process and interpret the human by the animal.

Antecedents & Consequents.

If in the evolutionary series we could be sure that we are dealing with a simple progressively continuous sequence, it might be logically correct to predict end-results from a knowledge of early or middle terms. But the whole issue lies in this very fact, that in evolution we have no evidence of such simple sequence. As A.E.Taylor has pointed out, given the first three terms of a series, say, 1, 3, 9, the

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i. Matt. 8; 20.

average person, when asked for the fourth term in the series would unhesitatingly reply, 27. But the fourth term in the series may have been 25; for the questioner may have had in mind the series of which the general term is $1+(n-1).2^{n-1}$, and not 3^{n-1}.

It is such a situation, we submit, which confronts us when we attempt to evaluate human worth in terms of the evolutionary process. The series is not simple continuity, but continuity interpenetrated with significant qualitative distinctions. If it were at all possible to symbolise the process of evolution in algebraic terms, the formula would have to be of the nature $2+2=5$. Continuity is a misleading notion when interpreted to signify that all the data of experience is reducible to the 'dead level of a single type'. Christian theory must reject as false the conception of nature which merges man in the sub-human antecedents which comprised his background of emergence, for the reason that origins and outcomes cannot be equated.

Time succession is no guarantee of necessary causal relationship. To have come after is not necessarily to have developed out of, even if it does admit time relationship. "The true nature of antecedents is only learned by reference to the consequents which follow,

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i. Taylor. A.E. The Faith of a Moralist. vol.i. p.170.

or in other words, the true nature of the cause only becomes apparent in the effect...hence the futility of all attempts to explain human life in terms of the merely animal."[1]

Man, whatever else he may be, is a new synthesis of the life surge; the ground plan of his genetic affiliations has been dissolved and recombined, and the resultant synthesis has been achieved not only by means of resident forces, but by reciprocity with the creative factor which guarantees his uniqueness in the evolutionary series. Our essentially human characteristics are explainable only in terms of brotherhood, enriched by that spiritual bond which unites humanity to the reality at the heart of the universe. Only of man may it be said that he lives and moves and has his being in God.

The Dynamic Time Factor in Human Consciousness

In his discussion of the genuinely human attributes, Elliot Smith points out that man's behaviour is dominated by the effects of his own personal experience and the reactions of his social heritage, that is, the accumulated knowledge and traditions of the society in which he lives.[2] Elsewhere he has reminded us that there is no structure in the human brain which is not represented in the brain of the anthropoid. But the temporal consciousness necessary for distinctively human functioning is not represented physiologically in the anthropoid brain."They cannot acquire the vast store

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1. Pringle-Pattison. Man's Place in the Cosmos. p.12.
2. Human History. p.35.ff.

of complex memories which we have at our command, to compare and interpret the fuller significance of visual experience. Only the human brain is endowed with the aptitude for making this possible, by its almost unlimited powers of recording sensory experiences and feelings"[i]

This again constitutes a valuable clue to the worth of religious personality. It seems to be established that animal experience moves on the plane of associated ideas; mere perceptions, impulses and instincts make up the animal's world. In other words, the animal past is a dead past; the human past is dynamic; habit holds the animal; tradition holds and at the same time inspires the human. It is this creative time factor which serves to widen the breach between animal and human, and has made civilisation in the widest sense of the word. And in the development of this uniquely human value the acquisition of speech has played a major role; for through the medium of speech humanity has been able to transmit its accumulated experiences to successive generations, a condition of affairs without parallel in the rest of nature.

The recognition of this creative time factor has far reaching consequences. It helps, for instance,

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i. Human History p.44.

to answer the question why men,and men alone,seek to be different from what they are. Man is the only animal who deliberately sets about the business of re-fashioning himself as well as his environment. For the truly human is the self-conscious, and self-consciousness is the basis of self-criticism. The ape sterilised his possible humanity and stereotyped his apehood when he refused the 'unearned increment'of human consciousness.

With the emergence of homo sapiens there was achieved a degree of mental integration which made self-consciousness possible,and implied the power of self-criticism in the light of the past. Hence to men,and to them only,is it given to judge the present in terms of the past,and more significantly,to evaluate both past and present with reference to the future. Time for man is of the essence of his humanity,for it guarantees his self-consciousness,and this in turn is possible only through his consciousness of that which is 'other than self'. Hence through and in time man reaches out to eternity.

This condition carries with it the essence of the Old Testament plea that man is made in the image of God, and the vindication of the New Testament statement that the Kingdom of God is within us. And it is this which makes belief in a real Incarnation possible. There is that in humanity which

enables it to be the medium or the vehicle of the divine life. Ordinary space time categories are not capable of exhausting the content of this experience; we can only say that man has affinity with whatever is ultimate in the universal scheme of things.

To the reproach then of Huxley, that man is 'only an intelligent brute', we reply that we shall concede his pessimism provided it can be shown that other brutes are able to propound a theory of the eternal, or elaborate a doctrine of universal truth and beauty and goodness, or show signs of deliberately reshaping their lives in conformity with such an interpretation of the world about them.

Remorse;

"Having become self-conscious," says Hocking, "we have no choice but to see life for the good it is, and to be restless at the thought of exclusion from the good. To lose life..the quality of life..the possibility of responding to what we believe to be the best, and hence the possibility of being with the best, is a torment to man as it is not to other creatures."[1]

Here again, we must concede the utter separation of man from the brute. We may well believe it true that "the animals do not lie awake at night thinking about their sins." There is nothing more characteristic of humanity than its feelings of remorse and penitence. Popular psychology offers abundant instances of animals motivated by "human intelligence", even to manifesting the contrite heart! There is no reason why one should hesitate to admit the glimmerings of some rudimentary form of mind in the higher animals, but we reasonably protest against the fallacy of attributing sui generis rationality and morality to creatures whose mental functionings have been conditioned by long association with man in domesticity. Kohler claimed to find traces of 'repentance' in his apes,[2] but his apes were all domesticated animals. The "shame" displayed by dogs, when caught in an offence, is scarcely to be thought a real test of the primitive reaction of the 'yellow dog dingo'.

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1. Human Nature & its Remaking. p.143.
2. Creation by Evolution. p.306.

Domesticity introduces into the observed circumstances an element of secondariness and exposes the claim of animal 'intelligence' to the danger of begging the question. Close association of animals with human beings will go a long way towards 'humanising' and 'moralising' an animal, making it something more than a primitive brute.

The 'shame' of the animal, actually, is different in kind, not simply in degree, from the contrition of the human heart. The difference is one more implication of the dynamic factor in human time experience. The animal life is but an episode in the passage of nature. The feeling of 'shame' and 'penitence'-better classified as physical discomfort-is soon obliterated once punishment has been inflicted. The human mind does not forget. In spite of our best efforts-even when a sincere attempt has been made at reparation-the unsatisfactory past continues to reassert itself regardless of the passage of time, its force unabated. The human experience of time has depth and profundity unknown elsewhere. For self-consciousness implies moral sensitivity, and the sensitive conscience moves in a multiple dimensional region. It includes retrospection, realisation, and anticipation; it never ceases to reproach itself. The physical discomfort of the animal is replaced in man by an acute awareness of dissatisfaction with himself as well as with as with his environment.

Our human consciousness of wrong and guilt is uniquely our own, a tribute as we shall see to our greatness as well as a token of our misery. It presupposes a vital affinity with the life-sustaining elements of the cosmos, which in our opinion, has been characteristic in some degree of man from the very beginning. Keith finds it necessary in his evolutionary reconstructions to hypothecate in the manward headed stock a "tendency to big-brainedness." It would seem reasonable that this hypothesis should carry its own weight and bear its own implications. For this is simply the anthropological correlate of the religious intuition that "there is a spirit in man, and the inspiration of the Almighty has given it understanding." Nor are we compelled to assume that this tendency witheld its active functioning until the appearance of the actual human form, since, as Elliot Smith has poihted out, "the cerebral cortex acquired functions distinctive of the human status", before "the transformation of the face and body."

Truly, while the outer man perishes, the inner man is renewed day by day!

"There is a tide in the affairs of men, which taken at the flood, leads on to fortune." Likewise, there was a time in the evolutionary process when the human species, whatever its debt to its animal progenitors, responded to the urge of its real inner nature, and emerged on the new level of humanity, equipped with reason and conscience. Over the mark of the beast was superimposed the image of God.

Nature in giving birth to man, has provided in him for her own displacement. Other creatures could largely be finished by nature, operating on the principle of the selection of the fittest.

It is the glory of man that, within certain limits, he is free to work out his own salvation. Christian philosophy has its own explanation as to how the species which became man came to achieve its religious ideas and practices. The reason is a double one; the human yearning for God and the divine attraction of man. Man has his wants, but man at the same time is conscious of being wanted. This is his greatest claim to genuine worth.

4. <u>The Organism "Alive and Whole". An Ultimate Principle.</u>

It will be well at this juncture to preface future discussion and analysis with the reminder that for Christian thinking, it is axiomatic that man be interpreted in terms of living wholeness and nothing less than wholeness. No analysis of personality can be valid except on the understanding that undergirding and synthetically permeating the analysed components there is that integrative unity of living function which defies analysis, yet which alone gives meaning to personality, and which abides as a functional unity throughout its changes and growth in time. "The living creature is fundamentally a unity. In trying to make the 'how' of animal existence intelligible to our imperfect knowledge, we may have for study purposes, to separate its whole into part aspects and part mechanisms, but that separation is artificial. It is as a whole, a single entity, that the animal, or for that matter the plant, is finally and essentially to be envisaged."i

This new turning towards functional wholeness, owing in large measure to the work and influence of J.S.Haldane, is rapidly becoming bedrock assumption in biology and psychology. It represents a significant return to the Aristotelian conception that development is neither haphasard nor accidental, but that everything is guided towards its end from within, by its nature and structure, or 'entelechy'. This 'organismal ' conception is fully

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i. Sherrington. Presidential Address to British Assoc. 1922.

elaborated in the philosophical works of A.N.Whitehead. In his'Science and the Modern World', he states, "the concrete enduring entities are organisms, so that the plan of the whole influences the very character of the subordinate organisms which enter into it. In the case of an animal, the mental states enter into the plan of the total organism and thus modify the plans of the successive subordinate organisms until the ultimate smallest organisms such as electrons are reached...the electron blindly runs,either within or without the body, but it runs within the body in accordance with the general plan of the body, and this plan includes the mental state."[1]

Again, evolutionary theory forces upon us"a conception of organism as fundamental for nature. It also requires an underlying activity-a substantial activity - expressing itself in individual embodiments, and evolving in achievements of organism. The organism is a unit of emergent value, a real fusion of the characters of eternal objects, emerging for its own sake."[2]

We shall avoid the pitfalls of the fallacy of misplaced concreteness then,if we remember that in any experience there is always the central and actively organising ego. To quote the testimony of another writer.

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i. 1926. p.116

2 ibid. p.157

who develops the same general idea of the emergence of 'wholes' in cosmic evolution,"all action of whatever kind,which happens between mind and body in human personality,is to be traced to and ultimately accounted for by the holistic personality itself."[i]

We shall have occasion to emphasise this again and again. In any activity it is always the whole self which functions. Much of the implied psychological devaluation of human worth is traceable to the false abstraction of the parts from the whole.[2] Goethe sums up this fallacy well;[3]

> To understand the living whole,
> They start by driving out the soul;
> They count the parts,and when all's done,
> Alas the spirit bond is gone.

This activity of the whole self may manifest itself as a clash of conflicting interests and tendencies; but the conflict is none the less always and essentially the active functioning of an integrated unity,an organism maintaining its integration even in the face of discordance. This is but one more phase of the general fundamental philosophical problem of the one and the many. Christian psychology, discovering in human personality that striving towards higher life which transcends the strictly biological struggle

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i. Smuts. Holism and Evolution. London 1926. p.272.
2. c.f. the general trend of the Behaviouristic psychology.
3. quoted by Sorley. Moral Values & the Idea of God. p. 245.

for existence,has found it helpful to use the metaphor of dichotomy in describing predominant phases of this clash of self interests in man, speaking familiarly of the opposition of the soul to the body. So Paul and others have apostrophised the law of the members warring against the law of the mind. But the metaphorical force of this dramatica dichotomising should not blind us to the fact that in all circumstances the religious personality operates and experiences as a whole. The conflict,when it exists, is always within an integrated 'me' or 'you' .Hence the final appeal of Christianity is always to the whole man, and the final salvation of personality can be nothing less than a return of the human all to the divine love.

It is obvious too that the biological or the psychobiological category of organism,to which Whitehead asserts that the evolutionary theory drives us, is not in itself exhaustively explanatory of the religious person. For man is not the highest organism simply because he is the most complex collocation of atoms yet evolved; the hypothesis of incremental lifts in evolution, if it means anything,is a frank admission of the unique character of the human organism. Biologically considered, an organism may be considered generally as that individualised integration of life whose nature it is to maintain itself, and reproduce in the face

of a varying environment its structure and activities as a whole. But the level of development actualised in the higher integration displayed through self-consciousness carries the life synthesis a step beyond the reach of strictly biological categories of maintenance and reproduction.

Whitehead speaks of the organism as 'a real fusion of the characters of eternal objects."[i] It is this aspect of the category of organism which offers the most fruitful possibilities for the interpretation of personality as organismal. The final appeal of Whitehead is to a naive experience which tells us that "we are within a world of colours, sounds and other sense objects, related in space and time to enduring objects such as stones, trees and human bodies. We seem ourselves elements of of this world in the same sense as are the other things we perceive."

It would seem then that evolutionary philosophy may yet furnish us with a transcendent category of organism which is rich enough to include within its scope the world of beauty and values, two aspects of experience which religion holds to be fundamental to the interpretation of the human organism. For we worship the Lord in beauty and holiness as well as in sincerity and in truth.

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i. Science & the Modern World. 1926. p.156

Religiously conceived, the human organism is best understood as a fusion of meaningful experience; not simple reaction to a biological situation, but an active reconstruction of the whole self about a perspective centre of reference which includes the self, but radiates beyond it. The basal need of genetic preservation is soon overlaid in the human organism with a variety of desires whose satisfactions are guaranteed only on personal and not biological levels. The biological organism is still at the mercy of nature's whims; religiously, man has ventured to believe that his outreaching faith is objectively grounded in response to some 'movement from the other side'.

For this adventurous feature of man's religious life, the biological concept of organism has no adequate categories of explanation.

5. The Relation of Instinct & Personality.

v The psychological critic will probably remind us at this stage of the argument that we are passing all too easily into the promised land of spiritual values. We have scarcely scratched the surface of human nature, and there is much beneath the skin. "Scratch a Pole, and find a Tartar". So runs an old saw. But let modern evolutionary psychology scratch any human being and it uncovers a whole menagerie!

"In all of us, even in good men, there is a latent wild beast nature, which peers out in sleep."[i] These words might well grace the cover of an up-to-date book on human psychology. They were written 2300 years ago by Plato, who in a remarkable passage of the 'Republic' has anticipated nearly everything that psycho-analysis has to say, including repression, sublimation, censor and oedipus-complex.

We are obliged then to face the problem of the relation of instinct to the worth of human personality. We are not concerned here with a detailed analysis of the instincts per se. No two psychologists agree upon number of description. Our interest lies rather in assessing the worth of the claim that man has inherited from his brute progenitors an instinctive nature which threatens to engulf all that religion claims for him as distinctly human, and therefore valuable.

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i c.f sec. 571-2.

"The human spirit has ever remained the same. Even when it becomes encrusted with the influences, good or bad, of tradition,.....human nature is based upon the same primitive instincts and emotions". So speaks the anthropologist.[i]

"The instinctive impulses determine the ends of all activities and supply the driving power by which all mental activities are sustained".[i] Thus psychology. Tansley, who quotes approvingly the above statement from McDougall, states that 'by far the most important features in the structure of the mind, alike in man and the higher animals, are the inherited instincts."[3.]

It might seem at first then that we have escaped the Scylla of biological mechanism only to be wrecked upon Charybdis of psychological determinism.

Instinct functions in the interests of a Self.

Our escape lies simply in an analysis of the human personalities which probes deeper than even the instincts To begin with, we remind the reader that we safeguarded our approach by the proviso that for the Christian evaluation of man, personality is a unit activity which functions at all times as an integrated whole. It is clear then that any

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i. Elliot Smith. Essays. p.50
2. McDougall. Intro. to Social Psychology. 1914. p.44.
3. The New Psychology. p.24.

conception of man as an aggregate of instincts 'working blindly or in block fashion' will have to be repudiated. If instinctive activity means anything, it must mean activity functioning solely in the interests of a self whose synthesising autonomy may be challenged by their discordance, but not vitiated. Instinct alone can supply no explanation of personality. It may serve as a basis of human behaviour, but apart from the control and guidance of the whole self, it becomes a mere hypothetical abstraction.

Instincts may only be interpreted psychologically. "Their nervous circuits include branches that run through the highest nerve centre. That a nervous loop passes upward through the higher centres means to us that the instinct is an element of consciousness as well as of subconsciousness; it falls within what we call a mind."[i]

In other words, an instinct is from first to last under cerebral control, and after its first 'quasi-mechanical operation' is subject to modification through its bearing on other processes reporting at the nervous centre. To interpret behaviour in terms of 'block' instinct, is akin to the atomistic psychology which treats of sensations and feelings as if these were nothing but separate elements of experience out of which personality could be compounded. Instinct can exist only.

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i. Hocking. Human Nature and its Remaking. p.41.

for a self whose activity it is, and apart from that self it is meaningless. "The simplest mental act involves the whole brain."[i]

The worth of man, religiously considered, is in the fact that being a self-conscious personality, he can intelligently harness the raw material of life supplied to him through his instinctive activities and raise it to higher than natural levels in the interests of a self whose dwelling place is on the earth but whose resting place is in the heavens.

The notion of instinct per se is a hypothetical abstraction in yet another sense. It is impossible to work our way back mentally to an historically primitive original human nature. Nor does it help much to seek the primtive instincts in the child. There is no such thing as an 'isolated' infant. With the first social interchange of experience, a condition entered into practically at birth, any initial endowment of original human nature must necessarily be overcast. The 'crude instinct' is a will-o'-the-wisp.

Whatever life preparation may be distinguished as instinctive in man, is, we suspect, minimised in his case. The animal, because of its place in the ladder of life, is called upon

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i. Brain. vol. 34(xxxiv) p.191

to cope with the struggle for existence at a very early stage of its career. Hence it must of necessity equip itself with a means of survival suited to its precarious mode of life. Lacking the time to learn by experience, and barred from the benefits of the big brain, the animal's mode of response is instinctive, that is, biologically preservative. Instinct is a specialisation in the interest of a narrowed type of survival. Man has the option of a fuller and a more abundant life, hence in his case, whatever there be of instinct is overruled by the higher ends of the spirit.

Suggestive physiological evidence is not wanting to support such a conception of instinct. "In animals other than man, instinct attracts attention partly because of the conjunction of apparently superhuman cunning with subhuman powers of thought; in part because of the remarkable bodily structures which accompany them. Man lacks these striking organic instruments almost entirely. He has no horns, wings, humps, claws, quills, tusks, shells or sting. His body offers no visible foothold for notable functions of offence, defence or craftsmanship. He is relatively a smooth unmarked animal. Internally also his organs are undistinguished. Except that he is obviously neither fish nor fowl, his structure does not mark him for

this or that habitat or diet, nor for any special mastery over any part of nature. Physically he is as nearly as possible animal-in-general."[1]

The contrast is significant then, between animal nature which is generously furnished at birth for instinctive intercourse with life, and human nature, equipped with a few primary appetites, whose functioning is immediately destined[2] to be subservient to a self-conscious guidance.

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1. Hocking. Human Nature & its Remaking. p.46

2. "The functions of the central nervous system are not a palimpsest, where a new text is written over an earlier manuscript partly erased. The more primitive activities have been profoundly modified by the advent of the new centres, which utilise some of the faculties originally possessed by the older mechanism." Sir Henry Head. Brain. Vol.xxxiv. p.191.

Instinct & Human Needs.

The real significance of instinct still remains to be appreciated. It is always the whole self which acts, and its instinctive activities operate entirely in virtue of some life situation which has been evaluated as meaningful. This 'meaning' quality lies at the root of all human behaviour and rescues it from the chaos which would otherwise characterise a medley of instincts blindly pursuing their own ends. "The primary tissues of experience ought to be regarded as composed of meanings",[1] declares Drever. Later on he reminds us that"the psychologist is concerned with the experiences which underlie instinctive behaviour."[2]

These experiences underlying instinctive behaviour are the fundamental needs of the developing organism. As Ward has shown, life begins in a vague 'feeling continuum',within which there is a development of function according to the needs of life. The organism is never discovered as completely neutral or static, waiting to be stimulated into action in order that it might respond. From first to last the organism is active, and its activity is the effort to satisfy some specific need or needs which have challenged the organic activity to find satisfaction.

Instincts therefore are rightly interpreted

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i. Instinct in Man. p.131. 2. ibid. p.158

interpreted only against the background of the fundamental needs of the developing organism. The worth of human life is indissolubly bound up with the right satisfaction of these inherent needs of the self. At all times the organism is in the throes of some need,and this need tends to become the controlling factor in its activities.

We come out into the daylight then,when we recognise that instinct is to be evaluated strictly in relation to the need which it endeavours to satisfy. Biologically considered, an instinct operates for the satisfaction of some organic survival need, such as reproduction or preservation. Psychologically, an instinct functions when it satisfies the needs of a self. From the standpoint of religion, distinct but not separate from these other needs, an instinct normally functions in the interests of a self when its needs are related to the moral and spiritual ends of personality. In other words, the needs of the religious self carry it over into a region of the 'other than self'.

This sense of need and incompleteness, this striving for 'sufficiency' may be regarded as the psychological root of religion.[i] Every organism is striving to complete itself. This urge is so strong that if any break occurs the organism will make the most strenuous efforts to restore its wholeness. It was this striving towards completeness which made such an impression upon Driesch.[2] This urge to completeness is

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i. c.f J.A.Hadfield. Psychology & Morals. for cogent illustrations of this principle.

2. The Science & Philosophy of the Organism. vol.1.p.225

one of the most potent forces within the human organism. When it is denied, either consciously or unconsciously, the baulked instinct is unable to satisfy its need and sinks into repression and neurosis. A neurosis is indicative of the organism's striving for completeness.[i] In man this sense of need can be satisfied only on the personal level. Personality cannot complete its needs in anything less than personality. Hence the Christian religion is psychologically sound when it offers us an ideal grounded in a Person as the only real satisfaction of the needs which lie at the root of our religious worth.

We are ready now to consider some of the ultimate needs of man which mark his humanity and set him apart from the rest of the animal kingdom. Man shares with the other creatures certain primary urges, chief among these being the will to live and the will to create-that is, the instincts of self preservation and of reproduction. Probably all the other instincts are modified forms of the one fundamental need for sheer existence, namely the instinct of self preservation.

But the ground pattern of instinct in man is profoundly modified by the presence of the self-conscious factor, so that the urge to sheer existence becomes elevated into a hunger and thirst after righteousness, and the urge to reproduce becomes a longing for love. The assertion of the

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i. c.f. Hadfield. J.A. Modern Churchman vol.xiv Sep.1924

will to live is sublimated into the prayer that not we should live, but Christ in us, and the 'reproducer' is transformed into the lover. The biological needs in man are transfigured, and the transfigured needs in turn modify his instincts.

"The principal instincts of the mind normally demand constantly repeated satisfaction insofar as all the available psychic energy is not absorbed in some higher integrated conation, in the service of which the instincts are harnessed."[i] But the worth of man lies in this very fact, that as a religious being, he is constantly challenged by his needs to seek the integration of his psychic energies in a 'higher conation'. How else is it possible to explain moral and rational behaviour in man except through the recognition that at the heart of

> The fundamental need of man is life at its best. The first necessity of the search for such a life is to discover a centre about which the activities of the self may be organised.

As Christians, we are here compelled to rest our case finally in a paradox, which is nevertheless a very profound truth. The perspective centre of life for the

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i. Tansley. The New Psychology. p.70

religious man is at the same time within and beyond him. "The religious ~~self~~ consciousness...issues,like all other forms of spiritual life from a primal intuition of the self with an 'other' which is more than a mere'opposite'.. an other which responds. It comes into being with an interpretation of this 'other' and here again it does not differ from the remaining forms of life and spirit. It differs,, that in religion the affirmation of continuity and the intuition that there is response in the Object to the needs of the self are much more thoroughgoing."[i]

Any theory of personality which fails to distinguish this human need of the divine, and the divine response to that need has failed to reach the heart of man. The Christian affirmation is that no man at any time is outside of the divine environing. As a free being,he may refuse to cooperate with the divine,but he does not thereby void his humanity of the ability to replace self-centredness with God-centredness. But this affirmation of man's autonomy may have to be declared contingent at the last upon the divine imperative.

Over against the needs of instinct considered from the standpoint of biology and psychology we set the higher intuition that,expressed in all religion and art and philosophy and in human life generally, there is a universal

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i. Matthews. W.R. God in Christian Thought & Experience.p.17.

sense of need, expressing itself in the form of a desire to transcend what we presently are, the yearning for further attainment and completion. At its highest, this sense of need is a passion for harmonious integration with the reality that is drawing us on to completion. It is the lure of the Infinite that has drawn man on, the strongly felt though dimly understood intuition that 'God is at the helm, though very secretly".[i]

Hand in hand with this ultimate need of experiential unity goes the necessity of having that unity objectified and validated in a reality which can guarantee the abiding worth of the creations of our religious consciousness. If our 'sickly talk about ideals' is nothing more than 'self-paintings of the yearning spirit', they are as inconsequential as the spun foam on the crest of the sea waves. Our predicament in the universe becomes at the last intolerable if between our human values and the structure of the cosmos there is no organic relationship. Our instinctive desires give us every guarantee of their own reality, and no doubt it is true that our first notion of value arises in conjunction with instinctive desire; but while man is convinced of the reality of his own desires, he needs also to be convinced that he himself is a real object of desire. It is on the staunch affirmation of his religious faith that he <u>is</u> desired that man rests all the abidingness of his eternal values.

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i. Augustine Confessions. Bk.iv. XIV. 23.

It is not a valid criticism of the objectivity of the eternal values to point out that our human standards and our consciousness of the divine ground plan are in a constant condition of flux. It is the essence of the human spirit to change unceasingly, for the religious experience is vital, not static. The strength of the Christian interpretation of man is that he is always in touch with a living environment. What is generally overlooked is the fact that change in growth, mental or otherwise, is an indication of the emergence of new needs. Changes in human development are a hint that some inherent need of the self has failed to find satisfaction under the old regime, and the living spirit henceforth changes its direction. The Lamarckian principle in evolution, that new needs induce development and function is a generalisation full of significance for religious philosophy and practice. To study the organism biologically without reference to its needs is to be able to discern the face of the heavens without discerning the signs of the times.

Human nature is bound up with its religious needs. Hence the validity of the Christian doctrine of human worth which insists upon a recognition of the spiritual needs as fundamental.

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i. Matt. 16. v.3.

The "Religious Instinct".

May we claim for man a religious instinct? Alexander states categorically that 'the passion for God is no less real an appetite of our nature'[1] than the passion for food. Lloyd Morgan has laboured to maintain that in man new constitutive moral and religious sentiments have emerged which are 'instinctive in the broad sense of the term". Pratt, in denying a specific religious instinct holds that'inborn tendencies and needs,when combined with the power of thought and the will to think,are quite enough to account for some kind of religious attitude."[2]

We hesitate to answer our own question in the affirmative,so long as instinct is construed in the narrow biological or psychological sense of the word. Everything of course will depend upon what we agree to call the essence of the religious consciousness.

Religion seems to have close affinity with what we identify as the instinct of self-preservation. It is at least coterminous with the will to live itself. Prof. W.P.Paterson has suggested that this instinct be renamed as 'self-affirmation', so that its functioning may include not only the preservation of the self but its 'expansion' as well. This is a fertile suggestion for the interpretation of the primary religious experience,and might conceivably

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i.Space Time & Deity. vol.ii. p.341.
2.Pratt. The Religious Consciousness. p.71.

be made the basis of an instinctive intuition of that 'self-together-with other-than-self' relationship which is the core of the Christian analysis of human worth.

We reject as incomplete the psychological analysis of the religious experience typified in the work of Leuba,[i] who holds that religion is found where man comes into relationship with a power or powers of a psychic nature and makes use of them . This is magic rather than religion. The essence of magic is coercion of its object, a desire to make use of; religion is rather obedience to its object and a willingness to be made use of. Leuba is dealing with a secondary condition rather than a primary experience. He has failed to see the need that lies behind the outer expression.

McDougall's analysis is much more profound, seeking to ground the beginnings of religion in the fundamental instincts of man. Religion for McDougall is compacted out of fear blended with wonder, resulting in a complex of awe and reverence. The core of this reverence is a sort of retreat and advance, a shrinking from yet an attraction towards, a desire to flee the mysterious and yet a curious impulse to draw near to it. But all the time there is a fear at the heart of it. It is in the 'fear of the Lord' that religion has its beginnings here.

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i. Leuba. J.H. A Psychological study of Religion. 1912.

Obviously we are not very far removed here from Otto's "mysterium tremendum" and the"numinous disposition" which he places at the heart of the religious experience. But it must be confessed that we have not yet reached the vital core of religion. To both Otto and McDougall it might be suggested that there is a wonder which is not afraid, and a fear which is not religious. Schleiermacher profoundly supplements the analysis of religion as a 'feeling of absolute dependence'-although we are not sure how this feeling should be evaluated. We agree with him,however, in recognising the religious impulse as an inherent constituent of the human consciousness,which grows and develops in normal fashion with the mind itself. If we unite to Schleiermacher's analysis a recognition of the actively cooperating as well as the dependent side of the religious relationship,together with the sense of the sublime, interpreted through Otto's 'numinous', we are not very far from genuine religion. For the object of religious experience is not only a 'wholly other', it is also a'responsive other'. In this haunting sense of "mana"-the taproot of god-belief'[i] as Coe names it, lies man's ineradicable belief that his own nature is grounded in the structure of the cosmos in a relation of outreach and response.

Beyond this it is impossible to penetrate. To negate this is to deny ultimate human worth.

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i. The Psychology of Religion. p.90.

6. **Psycho-Analysis and Human Values.**

Breuer. Our discussion of the place and meaning of instinct has now prepared us to evaluate another phase of the evolutionary psychology,[i] which has significance for our theme. In 1895, a Viennese physician named Breuer, collaborating with his pupil Sigmund Freud, published a striking series of 'Studies in Hysteria', which was destined to become a landmark in psychological investigation. Based originally upon the hypnotic treatment of neurotics, the conclusion was reached that neurosis was the result of a repression or an inadequate expression of the instinctive tendencies of the individual. It was observed that neuroses vanished when brought into the light of consciousness, hence it was assumed that they must first have existed in the 'unconscious' in some repressed form, probably on account of their unpleasant associations for consciousness.

Freud. Taking this as his starting point, Freud himself perfected an elaborate technique of 'psycho-analysis'. Relying less upon hypnotic suggestion and more upon inducing his patients into a state of quiescence, where they would themselves 'talk their own neuroses out', and aided by his own interpretation of their dream symbolism, he achieved a valuable therapeutic method for the diagnosis and treatment of neurotics. Inevitably it happened that the psycho-analytic method so successful in the treatment of pathological cases, came to be regarded as valid diagnosis of all behaviour, normal as well as abnormal.

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i. c.f. Miss Hinkle's introd. to Jung's "Psychology of the Unconscious", for a history of the movement.

The working hypothesis of the psycho-analytis school is that personality is motivated by its unconscious instinctive urges. Modern psychologists differ in the number of instincts to be recognised. Freud has laboured to locate the source of all human behaviour in the one imperious and all pervasive instinct of sex. The 'libido', the urge of the sexual tendency to work itself out in action, is so frequently manifested in child life-according to Freud,- that he assumed it to be the normal activity of the growing infant. In the beginning this 'libido' functions auto-erotically, satisfying itself in the subject through breast-sucking, thumb sucking, etc. All too soon,however, it widens its range of interest beyond the subject and fastens its interest upon some external love object. Here enters the notorious 'oedipus-complex'. The growing boy exhibits a 'libidinous'attraction for the mother, and the girl for the father.

The upshot of the psycho-analytical interpretation is that the character of the adult is interpreted in terms of the repressed libidinous wishes of infancy, more especially of the important years between one and four. At the root of all neuroses, there is the 'oedipus-complex' in some form or another. Finally religion itself finds its origin here. For religion is now exposed as a means of escape for the self ffom the unbearable mental conflicts induced by the stress of our instinctive nature. The gods of religion are simply

'wish-fulfillments'. In part we find release from the conflict of our unrealisable libidinous wishes and desires by 'unconsciously' repressing them; we also escape by projecting our wishes into the outside world, thereby objectifying our mental strivings after unity. In the words of Freud, "a large portion of the mythological conception of the world, which reaches far back into the most modern religions, is nothing but psychology projected into the outer world...the dim perception of psychic factors and relations of the unconscious was taken as a model in the construction of a transcendent reality"[1]

Tansley. Following the lead of Freud and the rest of the Psycho-analytic school, Tansley maintains that "the tendency to projection arises from the mind's need of harmony with itself and the external world."[2] Primitive man projected his own personality into the forces of nature. "At a later stage of development the process of projection is gradually simplified..and we arrive at the conceptions of God and the Devil" i.e. the 'personifications of good and evil'.. "Hence the conflict is thus represented as caused from without"[3] and direct responsibility is escaped. "Freewill is thus revealed in its true light as "an invention of the moralists who felt that personal ~~freedom~~ responsibility must not be entirely disclaimed or the motive to right action would be destroyed."[4]

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1. Freud. Psychopathology of Everyday Life. Eng. Tr. p.309-10
2. Tansley. The New Psychology. p.135.
3. ibid. 136.
4. ibid. 136.

Finally we learn that Christianity has projected the idea of love into God, because "the oppressed majority must have consolation",[1] this ideal projected upon God being "an externalisation of the mind".[2] Religious experience is thus finally found out as the climbing of a rope, the end of which the mind has itself thrown into the heavens, and Julian Huxley is right when he declares that "the progress of psychology is today putting the final storey on the great edifice of naturalism."[3] All we need to convince ourselves of"the future of an illusion" is a course in abnormal psychology. The religious worshipper is then presumably sublimated into a devotee of the new psychology.

To the Freudian analysis of personality it is pertinent to reply that the child psychology, upon which it bases its conclusions is not confirmed by other expert observers in this field.[4] As a matter of fact the findings of the experts may readily be confirmed by anyone whox makes a careful study of child behaviour in the normal home. Jung legitimately abandons Freud at this juncture. The ordinary growing child regards the parent in the light of "protector" rather than as "libidinous object".

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1. The New Psychology. p.137.
2. ibid. p.137
3. Religion without Revelation. p.253.
4. Baldwin, Prior, James, Hocking, McDougall, Brown, Rivers repudiate the Freudian child psychology.

This interpretation of personality in terms of any overweening instinct is open to all the old objections levelled against the 'faculty psychology'. The enthroning of sex,moreover, is a travesty of the plain facts of normal experiemce. The'battleof the instincts' is a dramatisation, rather than an analysis. The stage is badly set, and the art is faulty,when this dramatisation omits the all important character of the integrating self in whose interests the life-play is staged. Normally the self is from first to last indivisible. Even in the instances of 'split' or'dissociated' personality so ably investigated by Morton Prince, there is always a basic unity of the self within which the dissociations occur, and into which they may be re-integrated when the cause of the split has been removed. The inherent life unity of the self,under ordinary circumstances, is too strong for disintegration; it is relatively only a few pepple who 'break up'. The actual measure of integration achieved by any personality will depend upon the quality of the ideal with which the self has chosen to identify itself for the time being. At this point, Christianity challenges the highest integration of the self with the master motive of the fulness of stature which was in Christ.

The Unconscious. The spear is thrust deep into the side of the Christian valuation of man when we are reminded that 'the most fundamental activities(of the human mind) are non-rational and largely unconscious.....that " the power of

conscious reasoning..plays but a minor part even in the most highly developed human being..that in many cases the apparent importance of rational activity is seen to be illusory,forming as it were, a mere cloak for the action of deep-seated instincts and desires."[i] If this be true,if the power to choose and behave rationally turns out in the end to be illusory,we are again in the grip of a determinism,either of the instincts or of the unconscious,and the worth of religious personality is negated.

We remind ourselves again at this point of the testimony of Hocking that the instincts are always under cerebral control;"their nervous circuits include branches that run through the highest nervous centre..which means that an instinct is an element of consciousness as well as of subconsciousness; if falls within..a mind." To put it in other words,"the involuntary nervous system,which controls the unconscious bodily functions,though it possesses a certain degree of subsidiary independent action, is essentially an outflow from the cerebro-spinal system and under its general control."

"There is no subconscious which is out of consciousness."[2] The rigid separation between the two is

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i. The New Psychology. p.14.
2. Hocking. The Meaning of God in Human Experience. p.537.
(this section of Hocking is valuable at this point)
c.f. Journal of Abnormal Psychology. vol.ii Nos.1-2
for a symposium on the subconscious.

is seen to be false, possibly only when we abstract the ever-present undergirding self-unity of the organism. What is presently 'an unconscious desire or wish' is distinct from the conscious in that the self has not yet been able to relate its urge to the meaning situation which will bring it satisfaction. The conscious desire is already aware of its 'to-be-attained' end and can satisfy itself in the attaining of it. The 'unconscious desire', unable for some reason or other-probably painful-to become conscious, will maintain its demand for recognition until such time as the inhibition is consciously recognised and removed by the self, or another pathway to satisfactory expression is opened up through sublimation.

In any case, the real basis of religion lies in our own conscious experience, in our awareness of values which determine the course of our existence. Insofar as we realise these values we are in touch with creative factors in a spiritual universe-the manifestations of God. "Religious truth must be developed from knowledge acquired when our ordinary senses and intellectual operations are at their highest pitch of discipline. To move one step from this position towards the dark recesses of abnormal psychology is to surrender finally any hope of a solid foundation for religious doctrine."[i]

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i. Whitehead. Religion in the Making. pp.123-4.

Elliot Smith and the"Quest for Life".

It will be highly instructive,at this point, to listen again to the voice of the anthropologist. Professor Elliot Smith, in his "Human History", argues most persuasively that the primal urge in man is a "quest for life". This life-quest is the recurrent motif in all the earliest literature of antiquity. Back of all the ritual and folklore of primitive peoples there is the same problem of "how to attain more new life". The deities of primitive people are wrongly interpreted as "gods and goddesses of fertility". They are "givers of life, not fertility mongers".[1] Men seek life rather than fecundity.

These gods, as creators of mankind, are regarded as the source of man's life, and their chief function is to preserve and to safeguard the life they have created."It has become the fashion to scent sex in all human behaviour..but the instinct of sex, even when its influence overflows the normal bounds of its natural functions, does not play the same kind of rôle as the more fundamental and continuously active instinct of self-preservation."[3] Man is convinced that in the affairs of sex he can shape his own behaviour, but in the matter of preserving life he is dealing with a problem of infinite complexity and mystery which he cannot

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i. p.34
2. p.34
3. p.34

for a moment evade, and in respect of which he needs all the help he can obtain. "This striving to achieve the ever-present and essential life quest is religion."[1]

Attributed to Jehovah in the Old Testament is the quality that "He could cause to live and make alive again." He is the "fountain of life". Again, the Hebrew phrase which has been translated "God save the king" has as its more literal meaning "Long life to the king". In other words "grant him a new lease of life". This becomes at once illuminating when we recall that "the earliest conception of a god was a pre-eminent human being who had died, and required to be re-animated by mortals in order to obtain the immortality which was the distinctive attribute of his divinity".[2] What men sought in the long ago, is the same as they seek today, life.

This universal quest for life has had curious repercussions in the history of civilisation. We are more than ever convinced now that economics rests upon a spiritual, and not a material foundation. For when we ask why it is that the nations have adopted gold as the standard of their transactions, we discover that the rank of the gold is something more than the guinea stamp; the metal stands

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1. Human History p.35
2. ibid. p.28

for something more than mere wealth.[1] When gold first came into use it had the reputation of being a divine substance.[2] It was as a matter of fact identified with the gods and goddesses who controlled the giving of life.[3] The world-wide searches of early man for gold, to safeguard the immortality of the king-through whom they themselves obtained new life-have been among the great motivating causes of civilisation. The unique status of gold today is but another striking witness to the universal quest for life which has surged in the hearts of men from time immemorial.

It is to this quest for life that the Christian evangel makes its strongest appeal. We begin to see more clearly the implications of Jesus as the 'saviour of men'. The meaning of the word is really 'giver of life'. Those who walked and talked with Him came somehow to see in Jesus the realisation of their search for life. He was the Life, and He came for the purpose of offering Himself to men as a fuller and more abundant life than they could possibly find for themselves. The gospel of the golden rule of love is the triumphant sublimation of the deep-seated search for life through the metal and the material gold.

Had Freud succeeded in building up a psychology on this higher basis of love, rather than on the level of sex, he might have filled a need which Christianity still feels, the need of interpreting in terms of modern dynamic categories the living spirit of its Founder.

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1. p.313 2. p.318 3. p.318

Religion as Projection.

We have still to consider the new psychology's most sinister threat to the Christian valuation of man. Christianity affirms man's uniqueness in the fact that his spiritual aspirations are objectively grounded in a real God Who is at once the source and conserver and enricher of all his values. Man has his desires, conscious or unconscious, but he is also convinced that he is really desired. The age-long struggle for the realisation of his spiritual possibilities is to be understood only in the light of this Godward affinity and attraction. Negate this and the axe is laid at the roots of the human tree of life.

It is just at this vital spot that the new psychology threatens to apply the axe. The objective reality of the God and Father of Jesus Christ is dissolved in the mists of man's subjective imaginings. To put it bluntly, our notion of God is nothing more than the outward projection of a 'father' image, carried over from infancy. To escape from the pressure of our inner discordance, we objectify the unity we are wishing for, and call our projection God. Once the projection is complete it takes to itself all the validity of objectivity, but its outwardness and reality is nothing more than an illusion, a 'wish-fulfilment' in the interests of mental unity. "In projection, as in repression, the mind refuses to acknowledge part of its own contents; but instead of refusing attention to the existence of the content in

question, it recognises its existence, while denying the ownership."[i]

To the illusionist, we reply that the description or explanation of a method of experiencing is no test of the validity of the content experienced. Psychology is free to describe the method of experiencing the idea of God as a 'wish-fulfilment', but the description of the mental mechanism operating in the experience of God is quite a different matter from negating or establishing the reality of the God Who is the object of the experience. Classified knowledge, which adds to the sum of human information, without taking into account the deeper needs motivating the desire for knowledge, is dealing only with a second hand situation.

Actually, of course, as many have pointed out, to discredit the validity of the religious object on the score of projection, leads inevitably to the impasse of discrediting the validity of all knowledge whatever. For in a very real sense, all knowledge is a 'projection' experience. The trend of modern scientific interpretation is decidedly in the direction of a symbolism which recognises that the various laws descriptive of nature's behaviour are mental constructs conditioned by certain characteristics of the perceiving mind. But the scientist, in thus 'building up his world, does not thereby destroy its reality.

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i. The New Psychology. p.133.

Behind the psychology of projection, there is a fallacy of faulty abstraction. It presumes that the self may exist apart from its object. But no self is ever an isolated self, functioning apartk from the subject-matter of its own experience. Every experience involves a reciprocal activity of experiencer and experienced. In the act of experiencing there necessarily emerges, as distinct from the real content of experience, an interpretation, which though distinct is never separate. It may be isolated for the purpose of psychological analysis, but the real self is never at any time apart from its "experienced".

The difference between religious and ordinary experience is not absolute. It is mainly a matter of the interpretation placed upon the content of experience. The self at all times has an inseparable continuity of contact with its "other than self", without which it could not be a self at all. For religion, this "other than self" is interpreted as God.[1]

This religious interpretation of experience, like any other, has to express itself through the mental mechanism available for the purpose. If this is to be called 'projection', we shall have no quarrel with the name. But it must be insisted that the reality of God, or of any other experienced object is not invalidated by reason of the projection element which operates in the experience. There is no other way possible to human beings but to think of God in terms of our own personality.[2] But the fact that we think of

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i. c.f. later on in connection with Karl Heim.
2. this of course does not exhaust the divine nature.

Him in terms of what we know of our own personality is no more an argument that our thought is illusion than the relativity of our space-time conceptions of the external world is an argument that if you destroyed all the people who believe in the world you would destroy the world itself. "No answer to the question how we come to hold a belief is of itself an answer to the question whether the belief is true."[i]

The noteworthy feature of the 'God-projection' lies in the religious fact that it has power to evoke in man value-responses which are sui generis, and not otherwise obtainable. The religious experience, from the very beginning, has been nourished 'sub specie aeternitatis', conditioned by the sublimity of that 'Other' Whose presence alike pervades natural phenomena and haunts human aspirations. Blended with this sense of the sublime there has been a profound intuition that the good itself was true. These rising religious experiences, bearing upon man with the full force of their imperative, have convinced him that they are not earth born. Man's own heart tells him that they are beyond his power to create, let alone achieve. The height of the high and the holy, the depth of the moral compulsion, the span of the lovely, these are man's despair rather than his creation. They are from above, not from beneath. Hence our recognition of Christ's command to Nicodemus to be born again, 'from above'

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i. Taylor. Evolution in the Light of Modern Knowledge p.474

Man can appreciate absolute values, but he cannot create or conserve them. His 'projection' of them is contingent upon the reality behind them which has quickened his own spirit into newness of life, so that finally men have been able to say 'by the grace of God, I am what I am.' H.H.Farmer sums this up succinctly. "Only the thought of God as the Father Whom Jesus knew can present man with the environment in which progressively fear is exorcised, the sting of death removed, the surges of egotism subdued, the remorse of conscience assuaged, the claims of the intellect sufficiently satisfied."[i] Man's apprehension of value is a paradox apart from the reality of God. For the Christian, the paradox resolves itself in the historical objectivation of the Supreme Spirit in Jesus. In Him, fact and value were merged, and objectively manifested when the Word became Flesh and dwelt among us.

If it is true that man has 'projected' his experience of God, we welcome this new vindication of what religion has always held to be the distinctive feature of man; for the projection can have been made possible only because there is within man's make-up a God experience which can be projected. This is one valuable lesson which Christian philosophy may learn from the new psychology. As Hocking has

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i. The Experience of God. p.181.

argued,"The Idea" must precede "the idea", "The Infinite" must precede "the ~~x~~finite". This is the ground upon which God and man may meet. "The divine purpose is that values should be realised in man's nature, and it can be attained only by man making this purpose his own."[i] The psychological analysis of projection is not deep enough to explore the depths of what is involved in man 'making the divine purpose his own." The valuable element is the experience, and it is always primary.

In the light of this we understand the 'crude functionings' of the spirit, in primitive religions. Primitive man does not first 'create' his gods out of wood and stone, and then 'project' into these a supernatural significance. The reverse is rather the truth. Man experiences- in proportion to his power to assimilate-and then endeavours to interpret his experience as best he may with the mental equipment at his disposal. The interpretation becomes richer as the experience expands, but the religious experience is primary, and objectively conditioned.

To sum this matter up, the vital distinction between 'projection', considered psychologically and religiously lies in the quality of the compulsion which motivates the 'projection'. Psychologically, man projects what he would like to be; religiously, he projects what he ought to be; The psychological projection depends finally

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i. W.R.Sorley. Moral Values & The Idea of God. p.492.

upon an unconscious instinctive urge, the illusory appeal of a temporary physical desire; the religious projection depends upon a conscious moral imperative, the eternal conviction of a spiritual need. Doubtless it could often be charged against some forms of religious projection that "thou thoughtest I was altogether such an one as thyself"; but the genuine religious experience of God cannot be so charged. For the God of the religious man is a jealous God, and a stern task-master. He imposes upon his worshippers moral restraints and sacrificial burdens such as no subjective wish-fulfilling projection would dare to do. "Above and beyond all things the religious life is not a research after comfort".[i]

This implies in the long run that man's 'projection'of God is not the free creation of his own imagination but the spiritual symbol of his responsiveness to the divine aggression.

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i. Whitehead. Science & the Modern World. p.275

7 Conscience.

Psychologists have hesitated to grant to religion this claim of the sui generis nature of the moral imperative which we have held to be the objective background of religious experience, and have sought to explain conscience in terms of naturalistic categories. The attempt has not proved successful.

We have already argued for the emergence of self-consciousness as the new departure accompanying and characterising the emergence of the distinctively human. We suggested that self-consciousness carried with it the potent seed of the moral conscience. At the same time we admitted that the moral consciousness, while a unique emergence, required a social milieu within which to develop and expand its function. But to grant that the moral conscience arose in,and flourished in,social conditions, is not to admit that 'the ought' is thereby a social product, any more than to recognise the evolutionary affiliations of man is to confess that his present condition is a direct contimuity of sub-human antecedents. The whole evolutionary process,psychically as well as physically, is bristling with constant new starts all along the series. No matter when or how or where the sense of moral obligation emerged,it implied the dawn of a new life synthesis, a new ability to traffic with the environment on the level of'value-discovering',a new power to cooperate with personality-enriching factors previously unavailable-not because of their absence-but through lack of articulated organs of outreach.

Conscience is neither emotion, nor social product,nor herd instinct. It has affinities with all three but identity with none.

It is not emotion. It is rather a selective principle of self conscious judgment which has its own peculiar feelings of satisfaction or dissatisfaction according to the outcome of the whole activity which is under surveillance. This ability to select and criticise and discriminate arises out of the fact that self-consciousness,even in its most primitive form,is never an isolated consciousness, but a fellowship of the private self with that 'more than self' whose continuous environing represents that progressive degree of cosmic enrichment which the self is able to appropriate in proportion to its ownn articulateness and its growth in experience. We are not born with a finished moral code. But we are born with a degree of integrated intelligence, and this intelligence is able to exploit its autonomy in the moral as well as in the perceptual sphere of experience, with increasing efficiency.

Neither is conscience mere social custom, since it depends largely for its genuine growth and expansion upon its ability to criticise and transcend social conventions and taboos. Moreover we believe,with Sorley, that there is sufficient material in the individual life integration- apart from its

overflow into the social milieu-to furnish data for a qualitative value judgment out of the relative values of the different personal desires and volitional systems experienced within the self. "Even if religion and morality were dismissed as illusion," declares Eddington, "the ought still has sway".[i] Apart from the social content of conscience there is an experiential unit of value in the moral imperative which evades naturalistic analysis. The self, before it can know itself as such, must have social affiliation, but the self has value nevertheless as a unique, though not an isolated, core of life. This uniqueness is shared by the moral conscience. We take it that this sense of the self's private worth is involved in Whitehead's paradox that 'religion is what the individual does with his solitariness."

Again, conscience cannot be assimilated into the instinctive life of man. It undoubtedly shares the conative impulse of instinct, for conscience is creative, not static. But the urge of instinct is from beneath; the urge of conscience is from above. Its critical function is not confined to discrimination through former stereotyped standards; it creates new norms of value in proportion as the whole self absorbs enhanced worth from the environment through experience. Hence it is legitimate to expect changing standards of obligation and duty in relation to changing life-situations, without compromising the fact that

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i Science & the Unseen World.

there is just as much content of duty in the new situation as in the old. The imperative of duty remains as an integral part of the whole self throughout all its changes in time. Conscience is that function of the self which criticises its own metaphysical nature and stimulates it into new cosmic direction. It is humanity's most subtle instrument for integrating potencies and perversities.

Conscience transcends instinct or desire in the quality of its motivating compulsion. Desire is experienced as an activity of the self proceeding wholly from within. It is different with the moral obligation.[2] Its autonomy may be self imposed, in the sense of being personally accepted, but the imperative of conscience contains a 'without' as well as a'within'. Our very acceptance of its demands implies objective significance.

The coupling of conscience with the 'herd-instinct' is on a par with conscience and social custom. The criticism is similar. Thoulless[i] acknowledges the part played by the 'herd instinct' in developing the religious consciousness, but rightly points out that the development of this experience calls for a complementary activity, namely the instinct to suppress and antagonise the herd instinct This is a legitimate criticism, for it rarely happens that 'vox populi' is'vox dei'. The men of true conscience-and

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i. Introd. to Psychology of Religion.
chapter on the Herd instinct.

2. c.f J.E.Turner Philosophical Basis of Moral Obligation.
p.222.

hence of true worth- have been those with the courage to listen to the true self, and to obey its demands rather than those of the "herd".

Finally, anthropology refuses to admit the concept of a 'primal horde' or a 'herd-instinct'. The evidence reveals no trace of the assembling of any herd of primitive man, other than the family group, either for self defence or any other purpose."[i]

Each stage in the evolutionary process must be taken for what it is now, rather than what is has been; not so much what it has developed out of as what it has developed into and has the power yet to become. Each new life synthesis carries within itself the norm of its own interpretation. The Christian interpretation of conscience recognises the presence of that 'responsive otherness' without which all religious experience is a paradox. Man's developed sense of the eternal values, experienced in part through the instrument of conscience, testifies to genuine kinship with a value enriching element in the cosmos. God does not implant a full grown conscience. He is we believe the sustaining background of those conditions of experience with which man can cooperate towards the enrichment of the personality for which he has been made responsible. Through conscience, we recognise ourselves as citizens of some larger spiritual world in which the imperative of morality is necessarily grounded.

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i. Elliot Smith History of Man. p. 255

In arriving at a description of the fundamental religious experience we are not yet accustomed to the thought of imbibing inspiration at the springs of science. But we are indebted to Whitehead, nevertheless, for a clear perception of the primary paradox which lies at the heart of the Christian consciousness. "Religion is the vision of something which stands beyond and within the passing flux of immediate things, something which is yet real, and yet waiting to be realised; something which is a remote possibility and yet the greatest of present facts; something which gives meaning to all that passes and yet eludes apprehension".[i]

This lure of the Infinite, proportionately apprehended as the organism is spiritually integrated, affirms the presence of the Eternal in the present moment of experience. Here the human element in the 'God projection' is transcended. In the religious experience both God and man literally <u>come into their own</u>. There are real truths which are only spiritually discerned, even if they are psychologically described. "As many as are led by the spirit, they are the sons of God."[2]

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i. Science and the Modern World. p.275
2. Romans. viii. 14.

8. The Positive Contribution of the New Psychology.

The new psychology has not yet received the right hand of fellowship from Christian theologians, and it has scarcely merited it. The Christian philosophy of man was bound to take up arms against a foe which invaded its "sanctum sanctorum", threatening to desecrate the ark of real religious experience. Humanity, voided of a genuine religious consciousness grounded in a real God, loses all its distinctive worth.

Nevertheless Christianity is indebted, and deeply obligated to psychology for a fresh insight into the worth of man, and a profound appreciation of the processes at work within his moral personality.[i]

Behind the pictorial diagram of the "unconscious", and the instincts, there lies a very real religious truth which Christian theory cannot afford to neglect. Man's religious worth is not understood apart from the knowledge that 'beneath' the consciously controlled moral and spiritual motives of his life, there is the surge of "repressed personality" seeking expression through other than consciously motivated

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i. For an excellent appreciation, in readable form, of the contribution of psychology to the understanding of religious personality c.f. "Psychology's Defence of The Faith". D. Yellowlees. Published by the S.C.M.

behaviour. The hypothesis of the unconscious has the pragmatic efficacy of reminding us that racial as well as individual traits form part of our mental and spiritual equipment,and that the seemingly integrated personality might be harbouring,underneath the surface-a very real mental conflict. "Forgetting" is not necessarily nor always to be regarded as a mere lapse of time experience. It might be the symptom of a desire to escape from mental and spiritual discord,which succeeds only in repressing, but not in satisfying the discordant elements in the experience. Until the real way of life is consciously opened up, the repressed personality will strive for satisfaction, probably in illegitimate ways. The importance of this for the problem of sin is at once obvious.

The discovery of the 'natural man' is of course not confined to the domain of psychology. Certainly it is as old at least as Christianity itself. The 'complex' phraseology of psychology may give more expressive force to the facts in a modern scientific language, but it deals with exactly the same human nature which Christianity has always had to wrestle with.

The recorded activities of Jesus show quite clearly His understanding of the truth that life cannot move forwards into the fulness of its possibilities until certain barriers of repressed personality have been removed. To consider a familiar instance, Jesus on one occasion frankly explained to the wealthy young ruler,who inquired about eternal life, that the conditions of entrance included a conscious breaking down

of the inner barrier which was keeping the man out. Part of his life possibilities were cramped and repressed by his self-imposed powerlessness to adventure into a life where economics were not the finally important factor. The story, as we read it, is not intended as a stricture against wealth as such. The inhibiting factor might have been anything.[i] The story is a religious interpretation of life which takes its stand alongside the modern psychological judgment that the free course of the more abundant kind of life may be repressed by loyalties to lesser things. We may focus our personalities about 'slave sentiments' rather than 'master ideals'. The pull of the natural man may sidetrack the expression of the spiritual possibilities.

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i. c.f Luke 9. 57ff.
where Jesus deals with various 'defence mechanisms' which rationalised mens' hesitation to accept His invitation to follow Him.

Most of all, it is in their mutual insistence that the real life is a whole life, that religion and psychology may join forces. Psychology, in its prosaic scientific categories, dwells upon the need of an integrated personality. Christianity, in more poetic though not less insistent terms, emphasises the same need when it challenges the worth of a man with the kind of life which declares that if the eye be single, the whole body will be full of light.[1] It also urges the same plea for functional wholeness when it draws an analogy between the Kingdom of God, and the action of a man who, finding a pearl of great price, goes and sells all that he has in order that he might possess it.[2] And he can possess it at no less a price than everything that he has.

The progressive exorcising of the complexes which impede the free play of this larger life in terms of wholeness is as much the care of Christianity as it is the concern of the psychologist. Psycho-analysis, at its highest, is a sincere attempt to set the whole man free that he may live and love with undistracted heart and mind and soul. Psychology reminds us that 'fear is the great inhibitor of action'. Jesus in his own way counsels us to 'take no thought of the morrow'.[3] Psychology draws a vivid picture of the danger of the split personality. Jesus draws attention to the same peril when he declares that we cannot serve God and Mammon.[4]

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i. 2. 3. 4. c.f Matt. ch.6.
The whole Sermon on the Mount is most illuminating in this connection.

The supreme values of Christianity are suggested by the Kingdom of God, a conception which, like the diamond has many facets. Most of all this idea gleams with the thought of human brotherhood. Both psychology and religion are deeply implicated in the effort to remove the impediments which prevent the expression of the kind of character necessary to this brotherhood. Using its own technique, psychology traces the remote and immediate causes of such barriers as self-assertion and prejudice, seeking to sublimate their energy around the focus of some ideal sentiment. Christianity is no less urgent in its effort to release the larger life. The command that we should forgive not once, but seventy times seven, is only one of many practical warnings that until the barriers of pride and prejudice are down, the new life cannot come flooding in like the main.

J.A.Hadfield points out clearly the truth that nature will not give of her strength to those who will not expend their own energy, the law of the spiritual life being that only by giving may we ourselves receive. Psychology in this regard simply confirms the verdict of Christianity in its estimate of the worth of a man. "To him that hath shall be given, and from him that hath not, shall be taken away even that which he hath."[i]

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i. c.f. Matt. 25. 29.

The Christian valuation of man seeks its practical expression in personality integrated and motivated by the religious ideal, that is, in men and women who live and move and have their being in God. It is here that Christianity goes beyond psychology. Each presents a focus for the ideal integration of personality, but over against the "master-sentiment" of psychology stands the "Master-sentiment" of Christianity. The final sublimation of personality for Christianity is not a mere asceticism of the flesh; it is self-expression in and through and for the sake of the larger self. This larger self is conceived as operating in the living Personality which commands the whole-hearted service of those who recognise and accept its imperative. This life in the larger self marks the emergence of a new level of personality where psychological categories cease to be explanatory. It is only from within the religious experience itself that this new worth of man can be evaluated. Moreover the emergence of the new creature may be characterised by that abruptness which distinguishes all "emergence". On the other hand, the expansion of the new emergence mayx be a matter of education.

The advent of the new psychology has also brought with it a fresh emphasis upon the feeling element involved in experience[i]. Instinctive behaviour is seen to be coloured by the peculiar emotion which accompanies it and at the same time characterises its expression. This feeling-tone brings satisfaction to the self when instinct is functioning properly

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c.f. Shand. The Foundation of Character. p.57
for the feelings accompanying conscience.

around the focus of the ideal or sentiment with which the self has chosen to identify itself in action. It passes over into happiness 'when all the instinctive emotions are expressed in harmony'[1] Happiness, for psychology is the accompaniment of the well ordered life.

It will at once be obvious that in this emphasis upon right emotional satisfaction, psychology and religion are at one. The most characteristic note of the New Testament is joy; not the 'joy' which is usually associated with complacent quiescence or pietistic somnambulism, but the joy of achievement which comes when the religious individual has associated himself with a programme of right living and conduct. This was the joy which Jesus offered to those who were willing to accept the ideal of the Kingdom of God and to organise their lives in terms of its inspiration. In the parable of the talents,[2] the reward of the working servants was the invitation to enter into the joy of their Lord. The first-fruits of the spirit are love, joy and peace.[3]

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i. Hadfield. Psychology & Morals. p.86
2. Matt; 25. 14ff. 3. Gal. 5;22.

9. Sin. The Negative Element in the Religious Worth of Man

So far as our argument has gone, we have discerned in man nothing but positive values. This however, has been possible only because we have deliberately ignored until now a very profound negative assessment of the worth of humanity which religion itself has arrived at. We refer to the fact of sin. Tradition theology has been so tragically impressed by the magnitude of this flaw in human nature that it has not hesitated to hold up man as the signal failure in the universal scheme of things. The whole creation fell from grace in Adam. To deny this final tenet was to undermine the very foundations of faith.

Evolutionary theory has simply opened up a new perspective without invalidating the reality of the fact of sin. The Adamic anthropology, with its primitive psychology of corporate guilt, has been replaced by a sense of individual and social responsibility in which each man is his own Adam. It is interesting however, to see an optimistic trend in certain schools of anthropology, where natural man is again hailed as nature's gentleman. Elliot Smith[1], and H.J.Massingham[2], both see in primitive man a state of innocency, unsophisticated as yet by contact with civilisation, and they leave us with the suggestion that man would be better than he is if he had been left to the free unfettered sway of his instinctive life. "No interpretation of human

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1. History of Man. 2. Golden Age.

character can possibly conform to the principles of scientific inquiry unless the justice, veracity, and fidelity of natural man is admitted as a fact of observation, and any departure from such innate morality as the result of some specific interference, physical, psychical, or social, with the natural process."[1] "There is implanted, in every human being, an innate sense of honesty and goodness-which Elliot Smith locates in the thalamus-"quite apart from the conventional ideal of morality"-located in the cortex and hence secondary.[2]

Instructive as it might prove to follow up this highly suggestive lead, we prefer to let it stand just as it is. We have committed ourselves to the principle that each new phase in the evolutionary series carries within itself the norm of its own interpretation. Opinions differ as to the character of primitive man. We are not now dealing with primitive man but with man as we find him today, and man as he is cannot be trusted with the free unfettered coursing of his instinctive tendencies. The moral consciousness, when not blinded by its own conceit, confesses to an urge within the self which does not make for righteousness. There is that, "from within", "out of the hearts of men"[3], which has the power to trace the bar sinister on the shield of humanity's high lineage. Whatever explanation we shall finally arrive at, sin for us is a real, ugly and a tragic fact of human experience everywhere.

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i. Human History. p.196. 2. ibid. p.180 ff. 3 Mark.7.21

Evolutionary Interpretations of Sin.

How are we to explain the presence of this negative factor in personality? Why do we sin? Evolutionary is ready with its replies, offering us a variety from which to choose. Our sin is merely the sign of a faulty adjustment to the changing life situation. Here the explanatory concept is the biological category of organism and environment. Or our sin may be an atavistic throwback to the subhuman condition, the inescapable consequence of the strength of the instinctive urges within us. Sin thus becomes a natural impulse rather than a moral choice; under the guise of incompletely controlled appetite it evades the condemnation of the outraged conscience. Again, it may be nothing more serious than custom, since to err is human. Here "the touch of nature that makes the whole world kin takes the form of confessing a common weakness", and supposes that in confessing its weakness is has glossed over the heinousness of the sin. The contribution of psychology is much more profound, making for a much needed distinction between sin and moral disease. We have been brought to see that what was formerly attributed to deliberate evil-doing may be better understood in terms of dissociated personality induced by repressions and complexes for which the conscious aspect of personality should not be held responsible.

To our way of thinking, neither anthropology nor biology nor psychology can furnish the categories which penetrate to the heart of the problem of sin. Anthropology has furnished us with a more intelligent understanding of the history of our development as human beings, but history never has the last word in any interpretation of living personality. Biology has given revealing insight into the mechanics of our inheritance, but it is bad biology to think that the ancient strands of our personality still persist in their pre-human texture. The organism is a unity, constantly renewing itself. The old threads of inheritance were well knotted when humanity emerged to take over the loom of life. It is sound logic that the higher cannot be interpreted in terms of the lower. Psychology in its turn has saved us from the error of identifying the psychopathic and the neurotic[i] with the sinning and the perverted, but it has been compelled to pause on the threshold of a religious experience into which it cannot enter. The problem of sin can only be dealt with through essentially religious categories since it involves a factor which transcends the space-time schema.

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i. The Freudian theory of neuroses is criticised and a constructive account of their nature offered in as." 'The Lancet' July. 17. 1926. by A.E.Davis, "Psychic Traum-

Sin as Religious Relationship.

All evolutionsry interpretations of sin are incomplete, in our opinion, because they evaluate human worth in terms of morality rather than in terms of religion. The distinction between these two brings us close to the crux of our problem. The essence of morality is the striving for successful adjustment of our mutual human interests, insofar as these are compatible with the maximum of social well being. Thus morality is free to interpret itself through the biological concepts of organism and environment. But the Christian valuation of man leads him into a higher destiny than merely taking care of himself and his group interests, for the simple reason that man is something more than a biological organism.

This higher destiny of man is discerned only in the strictly religious relationship. Religion means living not only for the sake of successful adaptation to human interests; it involves also the adjustment of our human interests to that more than human responsiveness in the cosmic environment, upon which we are dependent for the awakening of our richest personal experiences. And so far is religion above the moral plane that the religious adjustment may impose upon the moral and the social relationship a sacrificial imperative which cuts right across the morality level. It is a hard saying, nevertheless for Christians a very profound

> and necessary truth, that 'he that loveth father and mother more than me is not worthy of me"[i] We personally believe that the moral and the religious factors in experience are never at any time separate, but morality cannot be called upon to do the complete work of religion.

There is a supra-human element in life which awakens and nourishes our religious experience. This is the objective background Whose response to our spiritual outreach removes it from the taint of subjectivity. Sin is never anything less than a deliberate human breach of the relation between the two. Sin

> is not merely 'treachery to the whole scheme of things'. It might involve that as one of its many consequences, but the God against Whom man sins is not to be identified with the generally evolving cosmos. We mean by God that supra-personal and extra-human activity in the general cosmos whose actuality and possibility of good answers to our human efforts in the same direction. It is against this good personality that we sin, 'against thee and thee only'. Hence the truth that our despair and our sense of futility mark our human greatness rather than our cosmic insignificance. Our sin at the last is the bar sinister on our high lineage, for in his deepest sin man stands face to face with God Himself.

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i. Matt. 10. v.37

In this religious relationship, the divine imperative- which we scripturally recognise as the Will of God- is that men shall seek to foster the possibilities of personality within themselves and respect them in others, all the while aiming at the fulfilment of these possibilities of personality in terms of the divine goodness which was objectively revealed in the life of the historic Jesus.

Once a man has stepped out of this high communion, he has sinned. It needs no very profound searching of the human heart then, to confess that none of us may make claim to any merit here. This is the religious core of the primitive theological dictum that we are "born in sin" and need to be "born from above". Once this discovery has been personally appropriated-and discovery is never isolable from its complementary experience of revelation-then, as Professor MacIntosh has pointed out, "it is all over with self-satisfaction...we must either sink or swim, or we must find God. We are undone except as there is made free to us the forgiving love of God."

The final resolution of sin and the restoration of the religious status lies with the transcendent activity of the divine side of the relationship. Man is worth so much to God that He is unwilling to leave the links of the love chain broken. But man must come to the forge of his own freewill.

If this experience of divine forgiveness has no objective significance, we are ready to admit that nothing else in heaven or earth is ultimate; the silver cord is loosed and the golden bowl is broken...and the dust shall return unto the earth as it was.

Sin then is the deliberate violation of a personal relationship with the divine. It necessarily involves the deliberate choice of a human agent, who by his very nature as human, is free to cooperate with, or to set himself against, the divine good will, but not in the end to overthrow it. We have sought to show the strength of this subjective striving throughout the whole evolutionary process. We believe that it holds the key to the interpretation of the whole historical development of life. The evolutionary process is not a mere generalised capricious flowing through time; it is a genuine movement with sustained direction depending for its reality upon the ability of the organism to select-or reject-meaningful experiences out of the traffic with vitalising aspects of its environment. The culmination of the process is the moral freedom of man to labour with or against God. Human purpose finally emerges above natural selection. The seed that was sown and nourished in the garden of nature has blossomed into a tree in the garden of life.

Behind the fact of man's real freedom to rebel we find ourselves unable to penetrate. There is an unanalysable datum in man which deliberately sets itself in opposition to the rest of human nature, which fights even to the point of destruction a great part of the total structure of human existence. The apostle Paul was so impressed by the presence of this alien element in man that he was driven to declare, "it is no more I that do it, but sin that dwelleth in me".[i] But the practical Paul never for a moment finally dissociated this "sin" from the actual agency of the sinning personality. Sin is always a personal responsibility. It is extra-human and alien to life only in so far as man is unable to harness for good the power of its constructive might which motivates the freedom to sin. Sin may be starved out by diverting to healthier tasks the energies which have to be used by the self in exercising or resisting it.

Human experience confesses sin as a universal fact, yet not an inevitable one. It is doubtful if Jesus considered sin as unavoidable. He simply took for granted the obvious fact that humanity had sinned, thereby cramping its possible worth in God. Inevitability of sin would deny human autonomy and rob sin of its meaning. Man need not fall. His nature as man implies the freedom to risk a fall, and the power has been freely exercised universally. Yet behind the

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i. Rom. 7; 17.

negative dignity of human worth implied in the freedom to rebel and to fall, there is the positive power of the goodwill to surrender and to rise again. The final worth of a man is bound up with this ability of the whole will to reassert its autonomy by leading back into the convalescence of the spirit the fragmented will which has elected for the time to live apartkfrom the healing influences of the divine.

Sin is the great destroyer of human worth because it arises out of the decision to live apart from the Good.

Religious Value of Defective Personality

Our interpretation of sin as a deliberately willed violation of the religious relationship has exposed us to a problem which still awaits systematic treatment at the hands of Christian philosophers of human values. How are we to estimate the worth, religiously, of the individual whose will is defective, in such cases for instance as insanity and imbecility? W.R.Matthews reminds us that "in religion we are dealing with an experience which begins with the most primitive state of consciousness and does not have to wait for the development of full moral personality and self conscious reasoning. The first spring of religion is some immediate intuition or 'feeling' which lies below the ordinary conscious mental processes."[i]

We agree fully that the religious experience is

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i. God in Christian Thought and Experience. p.9.

a primary datum of personality, nevertheless a real problem emerges when the will itself proves abortive, perhaps from birth, and unable to appreciate its own value.

Speaking as a practicing psycho-pathologist, De Sanctis states that 'the conception of God is always lacking in idiots'[i]. We have personally known of such an aberrant 'personality', born limbless, remaining to all outward appearances nothing more than a drooling idiot till its death at the age of 19. Obviously of course such concepts as sin are outlawed here. But just how are we to assess the religious worth of such abortions? The social problem may be, and is, solved on a biological basis, by the 'removal' at birth, of micro-cephalic monsters, but the religious predicament as to the assessment of their religious worth still remains.

It will not do of course to relegate these 'unfortunates' to the faith that every evil has a divine providence concealed within it. Stated bluntly the final implication of such a creed is the demoralisation of God. There is a partial approach to the problem in the recognition of the reality of human agency in the evolutionary provess. The corollary to man's freedom to sin covers every aspect of life, implying the ability to mutilate as well as to create, and to introduce consequences into every act. Moreover the weakest link in the chain of consequences is not necessarily the last. At the same time, when all due allowance

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i. Religious Conversion. London. 1927. p.7

has been made for the power of free human agency to make or to mar personality, it still remains possible to ask in countless cases "who did sin, this man or his parents?"

In admitting the problem of defective human worth, we are now compelled to lay our metaphysical cards upon the table, since there is an underlying metaphysic in all things.

Life, for human beings, becomes valuable through the categories of birth, development and death- although of course it need not necessarily part with its value outside of these categories. No philosophy of man can escape consideration of beginnings and endings, along with the fact of real value existence which emerges in the growth and decay maintained between these two horizons. These are, so to speak, the loom on which man weaves the pattern of his earthly destiny.

But the pattern of our human destiny is little more than a jig saw puzzle until set in the framework of eternity. Seen from the standpoint of the totality of things, insofar as these are capable of human apprehension, the motif of the universe-if we read it aright- is the maintenance of those creative life conditions in cooperation with which our humanity may produce its own peculiar values and progressively increase its richness. Belief

in a law of necessary progress is no article in our religious creed, but it is academic commonplace that science today is opening up to us in nature a living reality in which the whole is more than the sum of its parts, and things are not only what they have become, but also what they might yet become. The evolutionary process is not a simple re-arrangement of previously existent constituent elements; it is a holistic activity which constantly issues in and facilitates the emergence of new and richer realities. Man is now compelled to acknowledge that he lives in and is organically related to a universe where the door is thrown open to possibilities hitherto unimaginable. The category of potentiality is objectively grounded in the experiential fact that the creative forces of the cosmos have found in man a responsible partner fit to be entrusted with the privilege of cooperative creativity.

The vital factor in this creative partnership is that the relationship is free, not determined. Man, if he so wills it, may refuse to let the creative process function through his personality. He takes the choice-and its consequences. He may even destroy the laborious gains of evolution which have issued in himself, and in the beginnings of a ~~societal~~ social relationship with his fellow-men. Again the choice and the consequences are inseparable. The

immediate result is a stultification of personality-what other results may be is not given to us to determine. On the positive side, man may vindicate the worth of his humanity by discovering in the heart of nature the secret of its own creative process and undertake to collaborate with it towards the establishing of the Kingdom of God upon the earth.

10. The Modern Recognition of a Meaningful Environment.

This recognition of the importance of the part played by environment in evolutionary advance is one of the recent significant admissions in evolutionary theory. The chief sin of Neo-Darwinism was not so much its naturalisation of man as its assertion of a meaningless universe in which man himself was nothing but a meaningless accident. Time was when to admit meaning and purpose into the universe was to be guilty of a scientific'faux-pas' . That day has gone. Science today is not ashamed to offer itself as the instrument through which the spirit of man may enter into creative affinity with the value-stimulating forces in the universe.

Henderson; The restricted 'adaptedness' of the Paleyan type is of course gone. But it has been replaced by a wider teleology of the whole which more and more impresses the investigating mind. The 'new teleology' of Lawrence J. Henderson is a case in point. Hendetson, interested in physical and chemical processes, rather than in strictly

religious values, concludes as the result of his study of the order of nature that the environment betrays a fitness for the maintenance of life hitherto unsuspected. His 'new teleology' arises out of the fact that had the physico-chemical properties of the earth's crust been anything different from what they are-particularly in the matter of water and carbonic acid-then organic life would have been impossible. Between the properties of matter and the phenomena of life he discovers a 'peculiar and unsuspected relationship', which does not disclose itself when the properties of matter are studied abstractly and analytically. But when viewed in the light of the whole scheme of things, both cosmic and biological, it has a dynamic significance in time. The whole evolutionary process is then seen to yield results "not merely contingent, but resembling those which in human action we recognise as purposeful."

Hence this investigator concludes his book[i] with the declaration that "the whole evolutionary process, both cosmic and organic is one, and the biologist may now rightly regard the universe in its very essence as biocentric."

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i. Fitness of the Environment. New York. 1913.
c.f. also his The Order of Nature.

Evolution and Potentiality.

Broadly conceived in the light of this whole movement, evolution suggests to us a dramatic description of life's striving to establish this 'biocentricity' of the universe, in an ascending ratio of increasing intensity. The effort begins in the 'material' matrix through which life first functions. Its present attainment is the integrated self-consciousness of man. Between these two events in the time scale the life stream has moved away from matter towards spirit, from the temporal to the eternal. But we have obtained our freedom at a great price, for nature has traversed the 'via crucis'. By reason of causes not wholly explicable in terms of human agency, life may fail to achieve successful integration in its embodying medium and attain only partial and abortive personality.

Yet even the arrested personality has its own value; there may be discovered the key which will unlock its prison doors.[i] However, if not, so long as there has emerged a private core of life, furnishing the necessary ground of an individual "being-for-oneself", there is present a life integration which possesses potential as well as actual worth. Ultimately, the difference of degree of worth resident in the normal and the subnormal, is relative, not absolute. Each life core lives its own particular moment of meaning with greater or less intensity, not only for its own sake, but

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i. c.f. the fact that the administration of the active principle of the thyroid gland can transform certain types of idiot into normal people in a very few days.

but in the greater life of the whole. This is the finally significant worth of personality, not so much its present actuality as its potentiality, arising cut of its affinity with the value-increasing phase of the cosmos. For this 'greater-than-self' is not conditioned by the space-time categories which hamper the free expression of human individuality. When it is conceived as eternal, love, its contribution to the enrichment of man's life is not even limited to what man can earn for himself. For the Christian, God so loves that he must give.

We come then to recognise the force of potentiality as a decisive factor in estimating the worth of personality. This, we consider, is a critical issue in any intelligent conception of evolution. "There is more in movement", declared Bergson, 'than the successive positions attributed to the moving objects, more in becoming than in the forms passed through"[i]. There is as a matter of fact the process as a whole, stimulating and conserving values richer than those yet actualised in the events of the human time schema. To quote the words of Whitehead, "The passage of nature-which is only another name for the creative force of existence-has no narrow ledge of definite instantaneous present within which to operate. Its operative presence, which is now urging nature

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i. Creative Evolution. Eng. tr. p.310.

forward must be sought for throughout the whole, in the remotest past, as well as in the narrowest breadth of any present duration. Perhaps also in the unrealised future. Perhaps also in the future which might be as well as the actual future that will be.[i]

In other words, life holds infinite possibility, as well as limited actuality.

Potentiality & Entropy.

In claiming potentiality as a primary postulate of the evolutionary movement in life and nature, we are not unmindful of the threat to potentiality in the law of increasing entropy. Seen from the standpoint of the physicist, some are convinced that the universe is ordained to a progressive degradation of its energy. The end of the matter is simple, universal equilibrium, and final annihilation. Potentiality confronted with entropy seems a broken crutch for life to march upon.

We are not persuaded however that the second law of thermodynamics may be legitimately converted into a universal proposition covering every manifestation of real experience, nor that the degradation of physical energy necessarily coincides with and involves the dissipation of the eternal values. For us there is a more ultimate question, namely whether the universe is a cosmos, and therefore possessing knowable intelligibility. We believe that it is.

We ourselves are not competent to evaluate

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i. The Concept of Nature. p.73.

the implications of the Einstein Theory. Some who are, have held that the pessimistic cosmological conclusions of the law of increasing entropy are avoided by the theory of relativity.[i] Furthermore, it is strongly urged by Millikan-though denied by Jeans and Eddington-that there is positive evidence of tremendous energetic synthesising processes at work in outer space, making for the re-organisation of finally disintegrated energy into a new condition of integration and complexity. Hence the ultimate fate of energy is reasonably conceived as a rhythmic ebb and flow into newness of expression.

Whatever be the final outcome of the disagreement among the experts, certainly in the biological segment of the cosmic circle there is a downright tendency on the part of the developing organism to shun degenerate change, and to avoid equilibrium, since equilibrium involves stabilised adaptation, and hence organic death. From the cell upwards, there is an anabolic process at work, constantly setting itself in antagonism to the katabolic process of physics. The organism is ever renewing itself, taking in new substances, replacing waste tissues, and regenerating itself in the germ-plasm.

In the supra-biological field of experience, the human organism escapes the degradation of physical katabolism by exploiting its affinity with the personality-

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i. Urban. The Intelligible World. p.402. footnote. This book-especially from p.273ff-is a valuable criticism of the concept of evolution in relation to values.

expanding elements in the environment which defeat equilibrium, The end result of the human anabolic reciprocity with life is the emergence of 'the new creature', liberated from the corrosive influences of time by kinship with the eternal.

The words of Julian Huxley are a cautious but candid admission of this anabolic movement in living things. "There exists a certain general direction of movement in the evolution of living things....we find(this) is movement towards a realisation of the things judged by the human mind to have value. It is a movement towards increase of power, of knowledge,of purpose,of emotion,of harmony,of independence. what is important is that the human idea of value finds its external counterpart in an actual historical direction in phenomena." [i]

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i. Essays of a Biologist. p.59 f.

Karl Heim's Doctrine of the Perspective Figure.

Our analysis of the significance of the evolutionary theory for the Christian doctrine of human worth had led us to reiterate the claim that this worth finally depends upon the fact that the spirit of man is at all times 'en rapport' with a creative background of extra-human experience which nourishes it and cooperates with it at every phase of its developing career.

This we believe expresses the essence of the Christian vindication of personality. At the same time we hold it to be the raison d'être of the whole evolutionary process. The private self is a real participant in all the living reality that is. Each present moment of its temporal consciousness is pregnant with the presence and the potency of the eternal. The Kingdom of God is within us. Now are we sons of God.

Such is the truth dimly intuited in Samuel Butler's identification of heredity with memory, leading to his displacement of the continuity of the germ-plasm by the continuity of experience. We are each a real part of the sum total of experience. Bosanquet leads us to a similar conclusion, but by a different approach, when he declares that "it seems well within the mark to say that a careful analysis of a single day's life of any fairly typical human being would establish triumphantly all that is needed in principle for the affirmation of the Absolute."[i]

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i. Individuality & Value. vol. 1. p.377

This conception of the self as finally concrescent with the sum total of living reality is philosophically supported today by the doctrine of "The Perspective Figure" propounded by Professor Karl Heim of Tübingen. Professor Heim considers that the "Relativist Movement", seen in Spengler rather than in Einstein, is one of the most significant facts of our day, along with the collapse of the "Dogma of Progress".[1] He opposes the moral caprice of the relativist movement with an experiential perspective rooted and grounded in the inexorability of the "Non-Objective".

The apologetic of Heim advances from the predicament in which Kant left the self. The philosopher of Königsberg bequeathed to modern epistemology a notion of the pure ego or 'ich' as the subject of knowledge void of all objectivity, this emptying of the self being the logical outcome of a process of denudation which began with the criticism of the external object sponsored by naive realism.

The valuable element of the 'ich' for Heim, is the fact that it represents a 'non-objectifiable' remainder of experience. The 'ich', as the operative agent in all processes of objectification of knowledge is able to escape disintegration into the process which it sustains. This was the great contribution of Kant to

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1. Glaube und Leben. p.406.

personal values, literally a rehabilitation of 'self-respect'.

But Kant, in reality, went no farther than to restore to us the self as an empty form essential to all experience, presumably reached by a process of intellectual abstraction. The self of Heim is richer than the 'ich' of Kant. Kant's 'ich' is cognitive, and lies behind a block universe. The self, for Heim, is intuitive, functioning through the whole will, and operating in the modern dynamic situation. Hence the fundamental distinction drawn by Heim, between the 'disinterested' judgments of science-valuable only for the detached calculations of the objective world,-and the 'trust' judgments of personal relationships,-which lift us into a realm of experience transcending the world of observation and calculation, since they unite us with the trustworthy element in Life itself.

Heim pounces upon this 'non-objectifiable' phase of the self as a striking weapon to bludgeon the relativism which has overflowed from modern science into modern morals. The absolutes of space and time having disappeared, it would seem that each individual is free to choose his own centre of reference in the space-time continuum, and to maintain it as unique for himself. Moral relativism concludes by analogy that the unconditioned is likewise banished from

its particular realm of experience, that each individual is free to select his own locus in the moral world, and that his capriciously selected standard has equal validity with any other. Hence the modern throwback to the Old Testament chaos when "every man did that which was right in his own sight".

But since the real self cannot be objectified, it is obvious that the objective knowledge of science cannot claim to exhaust the continuum of total real experience. We cannot, for instance, stand outside of our own unity of consciousness and regard it as a reified entity apart from ourselves. The 'ich' cannot be objectified, for it is always the 'ich' which is presupposed and necessary in the process of objectification. Hence there is possible to us- in fact always present to us, though so close as to be overlooked-a realm of immediate experience which carries its own absolute certainty, reaching beyond the realm of mediate experience objectively attained through the approximations and relative certainty of science. The certainty of faith is surer than the knowledge of science, for our experience of the self is the most intimate and immediate experience we have, and the inner self impinges upon a core of non-objectifiable experience where the cause and effect categories are non-operative.

Science, in other words, is unable to cope with the hinterland of the self, that penumbra of the non-objective eternal within which it originally lives and moves and has its being, before the process of objective knowledge emerges. Science has no immediate point of contact with this non-objective environing of the inner self, being once removed from it by the very fact of its objectivity. The self is already, and always, within this absolute experience, and intuits its relationship by the certainty of the faith element which distinguishes the'trust judgment'as against the calculation of the'disinterested judgment'.

All our experience then, according to Heim, is rooted and grounded in the background of a non-objective environment, and it ranges itself perspectively around its various centres of personal interest.

Consider,by way of illustration, the application of the perspective figure to the matter of our time experience. The perspective centre of reference here, of course, is the present moment of experience. Considered objectively, the present moment is an arbitrarily selected point, emaciated to the verge of annihilation in that film of consciousness which separates past and ~~present~~ future.All we experience in the present moment, objectively interpreted is the meagre 'now', narrowed down to a static pinprick of division between what has been and what is yet to be.

Perspectively viewed, the present moment is the crisis of experience, rather than its vanishing point. The richness of its context is guaranteed by the presence of the eternal non-objective, the hinterland of experience, which is constantly breaking into the present moment, diffusing it with a measure of fulness in proportion to the ability of the self to participate in the wealth of its background.

Hence the true evolution of experience, for Heim, is a perpetual transition from within outwards, from the immediacy and certainty of the primary experience of the non-objective, to the mediacy and probability of the secondary objective. The certainty of the immediate experience is primary and it underlies all experience.

The actual present moment of experience-when the self is so immersed in its non-objective milieu as to be inseparable from it- is likened by Heim to a 'dark chamber of consciousness'. This phase of the self's experience is too immediate for objective description; it can only be intuited through the function of 'faith'. The only description possible in objective terms is that the non-objective-or for the religious man, God- is never so farraway from us even to be near. This is the experience in which only spirit with spirit may meet. It has the same immediacy in its own degree as that which Jesus meant when he declared, "I and the Father are one" .

Hence the fundamental ground of all experience is a region of immediate certainty and continuity with the eternal non-objective, which is not at the mercy of the calculating approximations to truth discovered in the objective categories of science. This realmof real experience is intuitively apprehended by faith, never exhaustively catalogued by psychology.

The attainment of the objective is a movement away from this primary experience. In the dynamic context of the present moment, the elements of experience caught up into it are 'stressed' or coloured by the distinctive quality of the individual 'ich', thus receiving the impress of its particular individuality. Hence, with the passage of time, there arrives a stage of experience when 'things' emerge from the veiled chamber of consciousness. This passage of time involves a movement away from the immediacy of the non-objective into a region of 'memory', where the 'ich-stressed' content of experience is now viewed objectively, and may be studied and analysed according to the laws of an objective science. Memory, on this basis, is no longer a mere remembrance of former things which have passed away; it is now seen for what it is, the living witness to our immediate and unbroken communion with the eternal source of all life and experience.

A. N. Whitehead. Organismal Theory of Evolution considered as an application of The Perspective Figure to Nature.

Heim's doctrine of The Perspective Figure in experience suggests to us a valuable clue for the interpretation of the process of nature as well. It is, we believe, implied in the organismal theory of evolution enunciated in the philosophical works of A.N.Whitehead.[1] The "organisms" of Whitehead, are in reality so many modes of The Perspective Figure. They are the perspective centres whose variant intensities give meaning to the whole evolutionary process.

Whitehead's philosophy of evolution is rooted in the fertile concept of organism. "The enduring concrete entities are organisms".[2] "The evolutionary theory is nothing else than an analysis of the conditions for the formation and survival of various types of organisms."[3] "Nature is the locus of organisms in process of development."[4]

This concept of organism in nature is supplied by the concrete idea of organism as given in our own immediate experience. "If you start from the immediate facts of our psychological experience..you are at once led to the organic conception of nature."[5] In other words, we reach an intelligible understanding of the evolutionary process only from the human perspective, and as we have seen, the human perspective is illuminated and expanded "sub specie aeternitatis".

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i. especially in "Science and the Modern World"
2. p.115 3. p.149. 4.p.108 5.p107
all references to 1926 ed.

The organismal perspective applies to all the events and unities in nature, from the human organism right down through the scale of life into the minutest details of the inorganic. Every unity in nature manifests some degree of organismal perspective, maintaining its own centre of reference and activities within a hierarchy of organisms from electrons to personality. Even the atom is "transforming itself into an organism"[1] And"we find,in analysing the character of nature, that the emergence of organisms depends upon a selective activity which is akin to purpose."[2] This 'selective activity' would represent, in our interpretation, the ad hoc perspective of the organism at its particular stage of development.

The atom, in fact, is an amazingly intricate organism, possessing many inter-related parts, and exhibiting many functions and properties-energetic, radiating and wave properties-along with others whose nature makes its movements inexplicable apart from the recognition of a 'mind' property. So that even at this primitive stage of evolutionary beginnings, there is seen to be some rudimentary analogue of the perspective figure. For when we seek the character of the 'primary entities' we find that "we must start with the event as the ultimate unit of natural occurrence."[3]

This"event" has'contemporaries'-a past, and'a future'[4] In fact, "an event has to do with all that there is."[5]

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i. p.149. 2. p.157-8. 3. p.151. 4. p.106. 5. p.151.

In other words, long before the processes of conscious thinking are released on the level of clear recognition, there is exhibited in the 'primary entities' of evolution, a modicum of perspective For the electron and the atom have a distinct perspective life of their own. Their activities imply real relationships and functions. These in turn operate within a higher perspective than that which is manifested within themselves, as electrons and atoms. This 'higher perspective' is discoverable in the 'plan of the whole', outside of which no event has actuality. "The plan of the whole influences the very character of the various subordinate organisms."[1] This principle of cosmic perspective is 'perfectly general throughout nature...it represents no property peculiar to living bodies."[2]

Starting from "our own psychological field", Whitehead finds that "self-knowledge discloses a prehensive unification of modal entities beyond itself."[3] This outreach of the self becomes significant when we realise that "the organism is a unit of emergent value-a real fusion of the characters of eternal objects-emerging for its own sake."[4] The analysis of this 'interfusion of events' reveals the fact that these 'eternal objects" represent characters "which are required for nature", but "not emergent from it."[5]

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i.p.115. 2.p.116. 3.p.107. 4. p.157. 5.p.151.

The "specious present" of an event, represented by its "total temporal duration" manifests not only "the enduring entity which has emerged as a real matter of fact" but also " the individualised embodiment of the underlying energy of realisation".[1] This energy is bound up with the eternal objects,"the elements required for the very being of the process of emergence of organisms",[2] and with "the possibilities of value in respect to the synthesis of eternal objects".[3]

The whole process of evolution, it would seem, represents for Whitehead an interlocking human and divine perspective, a fusion of the organism with its other than natural background.[4]

Whitehead's hierarchy of "organisms of organisms" is paralleled by Heim's hierarchy of perspective ~~figures~~ centres. The ground forms of experience, for Heim, are space, time and other personalities. Within these relationships the various perspective centres rise in a hierarchy of increasing intensity. For Whitehead there is an increase in intensity from the "low type of self-identity attained by the electrons, to the life of the spirit"attained by the human.[5]

Each perspective centre, for Heim, is characterised by the common element of inexorability. The present moment, for instance, is not whimsically self chosen. It comes from the Non-Objective, to be received by the self. Time moves with

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1.2.3. c.f. p.153-4. 4. p.161. 5. p.289.

a relentless inevitability, characteristic of the unquestionable majesty of the eternal hinterland of the whole evolutionary movement. For Whitehead, the progress of the organism is towards further retreat into "the deeper recesses of the total fact."[i]

The continuity of the evolutionary process is not violated by the hierarchy of perspective centres any more than it is disrupted by the hierarchy of organisms. But the series is progressively enriched, at different levels, in an ascending scale, by frequent outcroppings of intensified experience, proportionate to the ability of the organism to expand its horizons through an increased power of reciprocity with its creative background. Hence the higher, while not an outgrowth from the lower, is in a sense its fulfilment; it incorporates the significant features of the lower, while emerging for its own sake on a higher level.

The human organism, from the Christian point of view, finds its highest perspective, and hence its supreme value, centred in the creative spirit of Jesus Christ. Life, centred about this perspective, moving outwards into the objective world of social relationships, carries with it the same inexorableness which characterises all communion with the eternal. This is the unconditioned imperative

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i. p.289.

summed up in the statement that"he who has put his hand to the plough and turned back, is not fit for the Kingdom."

The Significance of Jesus;

We have endeavoured to gather the various threads of our argument about the conclusion that man, regarded from the perspective of evolution, more especially through the categories of biology, psychology and anthropology, has fulfilled a genuinely creative rôle in cosmic development. We have noted the growing reluctance of modern biologists to interpret man as anything less than a self-conscious organism en rapport with a non-material environment which elicits and nourishes his peculiar spiritual potentialities. We have surveyed the trend of anthropology towards a full recognition of the antiquity and the uniqueness of humanity within the evolutionary series. Man is a genuine child of the far away past yet aloof from his fellow creatures in his possession of a distinctive combination of mental and physical characteristics denied to the rest of the animal creation. In breaking with the past he has retained an elasticity of form and function which facilitates adaptability and therefore guarantees development. The emergence of"homo sapiens" did not entail any break in evolutionary continuity but it did involve a totally new venture in the developmental history of life. Finally we have seen the spiritual singularity of man confirmed by modern psychology. The

human mind and spirit include a deposit of racial inheritance held in common with some of the lower orders of life but the ancient strands were well knotted before being woven into the texture of the new human personality. Man is thereby endowed with all the benefits of accumulated past experience and at the same time ensured a genuinely new prospect for the future.

It is not part of our task to trace here the evidence of this uniqueness of man in other regions of research. The words of H.Wildon Carr,however, are significant of the modern swing of scientific thought in general towards a full recognition of humanity's unique status within the time-series."The central basic fact..on which everything depends and from which the whole scientific structure is reared is <u>the observer attached to his system of reference</u>.....the principle of relativity and the new scientific concept of the universe start from this and revert to it."[1.] In our summary of Whitehead's philosophy of the organism, and Heim's doctrine of the perspective figure, we have noted the significance of this "system of reference" for our Christian valuation of man.

1. The Unique Status of Man. pp.170-1.

By the exercise of his genuinely creative rôle in organic development man has given a spiritual meaning to the whole movement of life. He has thereby achieved a pride of place which is peculiarly his own. With the emergence of human consciousness history took a deliberate step forward into something new. Human consciousness has changed the motive and altered the pace and direction of evolution. It has generated a milieu within which the social and spiritual genius of man can expand. This advance into richer life finally has been made possible because the growth of spiritual personality established a value enhancing reciprocity with those suprahuman energies within the cosmos which minister in a personal way to the outreaching spirit of man.

In the language of the Scriptures, man lives and moves and has his being in God.

Hence the active presence of God in human history and experience is ultimately discovered to be the key to the riddle of human development. This is the supreme fact which confers dignity upon the spiritward trend of the human personality. It is within this transcendent communion of man with God, which nourishes and educes humanity's spiritual possibilities, that we find the ultimate foundation for the Christian claim of the fundamental worth of man. Man is now revealed for what he is, the discoverer and the discovered of God.

Above all other creatures within the compass of creation man possesses such possibilities of personality that he thereby becomes an object of desire for God Himself. The final guarantee that humanity's spiritual explorations will be satisfied lies in the fact that man's need of God functions complementary to God's need of man.

This divine human complementariness is in the nature of a spiritual symbiosis.

We are compelled thn by the logic of our thesis to explore the significance of Jesus in relation to the claim of human worth. For Christian tradition declares that in Him we have not only a positive guarantee of the activity of God within the time series but objective evidence of His nature as well. In Jesus,the Man of Nazareth,the Logos of God is declared to have been made flesh and dwelt among men. In Jesus therefore we ought to discover the supreme clue to the worth of human life.

How is Jesus to be related to the evolutionary series? We dismiss at once the idealising tendencies of interpretation which neutralise His personality in " "the spirit of creative evolution". New Testament criticism has made it abundantly clear that Jesus of Nazareth was an historical personage. The Spirit was objectively manifested in a real human personality. The problem

before us is to estimate the quality of that Life in which God is declared to have been genuinely revealed and to see how it affects the worth of man.

Theoretically it is possible to include the historical Jesus within the evolutionary series as its highest factor to date. On this basis He might be interpreted as the peak of personal evolutionary achievement. We are all, so to speak, potential Christs in the making. The idea is attractive but all too flattering to humanity as we have come to know it. Moreover we are still confronted with the problem that a strictly humanitarian view of His life fails to do justice to the admitted facts of New Testament tradition. We are compelled in all honesty to seek a more profound interpretation of the experience which led the followers of Jesus to declare what religion at its best has always confirmed, namely that "if any man be in Christ it is a new creation."[1]

Our argument has already recognised the existence and stressed the importance of crises or turning points within the history of organic life. It has also maintained that these are not inconsistent with the doctrine of continuity in evolutionary development. From time to time the evolving organism has found itself confronted with perplexing situations in its environment,

1. c.f Moffatt "There is a new creation whenever a man comes to be in Christ." 2 Cor; 5. 17.

whether physical,biological or psychological,which could be surmounted only by a complete change of front. The"volte face" has meant a definite advance into complexity of form and richness of functions not hitherto demanded nor possible. Life has advanced holistically as well as by means of uniformly graded series, depending upon the nature of the circumstances. Such phenomena as mutation and quanta are now regarded as evidence of this sporadic tendency in life and nature. At the same time we are careful to dissociate ourselves from the theory that these "gaps" in evolutionary continuity are overcome by"ab extra influxes" of an extrinsic agency. Life we believe to be"all of a piece." Its unity may manifest itself in a diversity of form and function and method but it still remains a unity. The sporadic element in mutation and quanta are not evidence of haphasard change. They are simply expressions of a higher uniformity in life and nature which undergirds the cosmos but is free to express its nature in such diversity.

We are prepared then by our interpretation of evolution to recognise that the appearance of Jesus Christ in the flesh heralded the emergence of a new spiritual fact in history. For the first time in experience there was revealed in its richest possible concreteness the quality of that hinterland of life in which all existence is sustained. Christian tradition affirms that the appearance

of Jesus within the time series was historically real. In our opinion it was also redemptively necessary.

The eternal background which sustains all life and nature obviously includes factors making for moral redemption as well as factors supporting natural development. The proof of this is simply an appeal to the well attested facts of spiritual regeneration. Psychological studies such as James' "Variety of Religious Experience" introduced a modern ~~psychological~~ scientific recognition of the reality of that "larger life" which provokes and at the same time nourishes man's spiritual outreach.

In the natural order, when confronted with developmental crisis, the growing organism has been stimulated to discover richer channels of form and function through which it might evolve in order to overcome the crisis. We believe that crises develop also within the moral and redemptive order of human experience. The growth of spiritual consciousness is doubtless contingent upon the successful solution of such crises. These have called forth from time to time new types of spiritual personality fitted to cope with the challenge of the situation. Discussing the growth of the will in development, Hobhouse points out how "a succession of gifted men..seize for the first

time the nature of certain of the fundamental conditions that underlie the life of the individual..they reach down to the life of the soul and the spiritual order.. their teaching is an exposition not merely of the nature of man but of the being of God or the laws of existence."[1.] Their revelation of course is mediated through the intellectual level of their time,but at the bottom it is essentially an interpretation of spiritual life. The great prophets and reformers of the world are all of this order, born to cope with the crises of their generation and to lift life to new levels.

The moral crisis,however,may be of such a nature that the human organism,in itself, especially in view of its relatively recent emergence within cosmic history,does not possess the requisite equipment to cope successfully with the situation. In our own strength we cannot always stand. The pull of the past is both long and strong. It is constantly operative within us although the inherited nature of man is overcast with the mantle of the spirit. We may create for ourselves situations which humanly speaking we are powerless to control. In the exercise of that freedom of will which involves our downfall as well as our uprising we may endanger the forward movement of life as a whole. No one will

1. Development and Purpose. p.187.

fail to recognise the truth of this in the realm of personal experience. And history is but personal experience writ large.

In proportion as life increased in self-consciousness it increased also in its reliance upon the spirituality of the cosmos. The need became greater in proportion as humanity exercised its freedom to move away from rather than towards God. Immediately prior to the coming of Jesus Christ the factors in history governing moral and spiritual crisis were beginning to concentrate in the Orient. The growth of apocalyptic ideas is but one of the many evidences of this. Dr Charles, discussing the conception of the Messianic kingdom in the Old Testament has shown that the notion was transformed from a material into a spiritual kingdom about the first century B.C, because "at this period the earth had come to be regarded as wholly unfit for this kingdom."[1] A study of the social and religious life of the Orient will, we believe, confirm the verdict that the coming of Jesus was coincident with the necessity of a new spiritual beginning for the races of the earth. Humanity stood at the cross roads. The moral crisis was such that it required the aid of a more than human agency to lead it into richer channels of religious development. To safeguard the fulfillment of humanity's high destiny God Himself in the person of Jesus Christ stepped into the arena, compelled by the exigency of His own nature as Love to confront men with the challenge of a fuller and a more abundant way of life.

Hence in the fulness of time came Jesus of Nazareth, the Word of God made flesh. To ensure the ultimate spiritual development of the race God in Christ reconciled the world uhto Himself.

By His emergence in the time series it has been made plain for all time that the soul of man is of infinite and eternal worth in the sight of God.

This is the paradox of historical Christianity and the rock of offence upon which primitive paganism split. "The root of Christianity," declared Celsus," is its excessive valuation of the human soul and the absurd idea that God takes an interest in man." Christianity is intellectually perplexed by the paradox but it insists that experience confirms its truth. Apart from the conclusion that God was in Christ reconciling the world unto Himself the significance which the early Church applied to the person and the work of Jesus is meaningless. Humanity in Him was made the vehicle of a full manifestation of the spirituality that pervades the cosmos . Henceforth it was charged with a fresh dynamic so that if any man be in Christ it is literally a new creation. Now are we sons of God and it is not yet manifest what we shall be.

The doctrine of the Logos with which Jesus is identified in the fourth gospel carries with it all the modern implication of a creative Reason pervading the universal scheme of things. This doctrine is in course of being rehabilitated by modern scientific philosophy. The Christian view of life will welcome the return of the Logos category as an instrument of scientific interpretation but it will do well to insist that the scriptural doctrine of the Logos goes deeper than the modern intellectual conception in that it attaches a redemptive significance to the appearance of God within the time series. For the Christian at any rate Jesus is not simply the strongest link in t e evolutionary chain. To estimate the meaning of the Incarnation in terms of biological evolution without recognition of its redemptive efficacy is merely to be blinded by a successful scientific hypothesis which is thoroughly well documented in the natural order but by no means exhaustively explanatory of the real facts of spiritual experience.

Jesus came in the fulness of time, in more ways than evolutionary categories can apprehend. At different times and in different ways God had

already reveded Himself in past history. In the spiritual crisis of the first century He revealed Himself in person in Jesus Christ. The intuition of faith is confirmed by the processes of experience that man with all his unworthiness is worth enough to God to necessitate His personal intervention in in history, to save him from the consequences of his own folly.

The seal of the divine appraisal of human worth was set upon humanity by the Incarnation. This is the inescapable logic of the felt experience of the Church that God gave His only ~~Xxx~~ begotten Son that whosoever believeth on Him should not perish but have everlasting life. Jesus becomes at once the vindication of human worth in the sight of God and the foundation of Christian theism,for the Logos doctrine is an interpretation of Jesus and man which depends for its final truth upon the nature of God Himself.

Because God is what He is, man is what he is, and he is endowed with freedom to become the new creation that he may be in Jesus Christ.

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c.f C.G.Jung. Collected Papers on Analytical Psychology p.432

"The collective unconscious is the sediment of all the experience of the universe of all time and is also an image of the universe that has been in process of formation for untold ages."

The works of Jung furnish much collateral evidence for the idea of "racial memory".